The Lone Scout of the Sky

By

JAMES E. WEST
Chief Scout Executive

Boy Scouts of America

THE LONE SCOUT OF THE SKY

"BE PREPARED"

I am with the Boy Scouts.

Their Motto "Be Prepared" is the greatest factor for success in life.

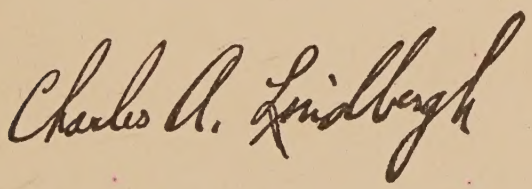
"Be Prepared" must include mastery of all the details of one's work.

When one *knows* he should go ahead and *do.*

The Scout must learn to carry on until the task is finished.

That is why I look to the Boy Scouts for the men of action, the doers, the fliers, the leaders of tomorrow.

"Be Prepared."



THE SCOUT OATH

On my honor I will do my best:

1. *To do my duty to God and my country, and to obey the scout law;*
2. *To help other people at all times;*
3. *To keep myself physically strong, mentally awake, and morally straight.*

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The cover of the new Boy Scout Handbook

The Lone Scout of the Sky

THE STORY OF
CHARLES A. LINDBERGH

BY
JAMES E. WEST
Chief Scout Executive

WITH SPECIAL CONTRIBUTIONS FROM
DR. JOHN H. FINLEY
COMMANDER RICHARD E. BYRD
CLARENCE D. CHAMBERLIN

CONTAINS
COMPLETE INSTRUCTIONS ON HOW TO
MAKE A FLYING MODEL OF
THE SPIRIT OF ST. LOUIS

PUBLISHED FOR
BOY SCOUTS OF AMERICA
By THE JOHN C. WINSTON CO., PHILADELPHIA

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Grateful appreciation is here recorded of the services of my editorial assistant, Mr. Peter O. Lamb, whose collaboration I have felt called for the inclusion of his name on the title page—an omission which I have consented to only because of his insistence.

James E. West

LINDBERGH

Every man longs to be a hero to some boy. *Overnight Charles Lindbergh became the hero of ten million American boys.*

The lone Pathfinder, blazing a trail through the arch of the sky *called to the blood of the pioneer in every American boy.*

His faultless engine, beating its ceaseless rhythm through the lone air wastes, *became the poem of American Youth's aspiration.*

He spoke of his plane as an equal partner in a great enterprise *and found a million echoes in the hearts of boys who know that things of wood and steel can live.*

He adventured as in knightly quest *and Romance came back to the young.*

He walked with modesty in high places and courtesy in low. Neither cupidity nor flattery could tempt him. In the moment of triumph he thought not of himself but his cause. *And America made him not only its hero, but the Symbol of its Idealistic Youth.*

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America's famous trio of transatlantic fliers—Lindbergh, Byrd and Chamberlin

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Col. Lindbergh flying over the Mississippi River at St. Louis after his return from Havana

THE SAGA OF CHARLES LINDBERGH

BY

JOHN H. FINLEY

"I HAVE a son. I often plan great things for him. I want him to be a poet and I have a feeling that he will be." So said the father of Charles A. Lindbergh when the lad was only five years old.

The dream and hope of the father have been realized—not that the son has written verse but that he has become a poet in the highest and oldest sense of the word, "a maker." He is Bellerophon of the ancient myth mounted upon the modern Pegasus. Thousands have written poems about his flight. But it was itself one of the greatest poems of all time. Homer, telling of the flights of demi-gods between heaven and earth, but imagined what this youth actually did. The ancient runemakers of his own ancestral race, beside their smoky firesides in the North, sang of the ravens, Hugin and Munin, that sat on Odin's shoulders and "each day set forth to fly" over Mithgarth, which is earth, never dreaming that one of their Norse descendants would in his own flight forth make a rune more moving than any of their composing, a saga more stirring than any of the days of old "by blue-eyed Norsemen told," more valorous even than that of "Leif the Lucky" who

came to the shores of the New World nearly a thousand years ago.

Lindbergh's lone flight was itself his saga, sung to the rhythm of his motor and the "zoom" of his propeller, in the silences of the sky, through cloud and sleet, by sunlight, moonlight, and starlight, while all over the earth beneath the telegraph instruments were clicking and telephone bells were ringing. It was the rune of youth sung in a new language and in the dawn of a new age—the age of the victory over the far, the age of a new knighthood, an age in which all that poets have ascribed to angels that "soar above" in a liberty of the air may be possible for men.

The Crusader Knights who went to the Holy Land in the Middle Ages called every way that led to it the "Via Dei," the Way of God. The path which Lindbergh, the new Crusader Knight of the Air, followed in his quest, "lone wandering in the abyss of heaven," was in a very real sense a "Via Dei," a way of God, since till this new age it has been

> a path ne'er trod
> Save by the glowing feet of God.

So long as the linden tree grows on the mountain and the eagle soars alone in the heights, this lone scout of the sky will be remembered by the youth of the earth.

> Though Time will change his youthful face
> It never will his deed erase.

PART I

A CHALLENGE TO AVIATION

A transatlantic non-stop flight between New York and Paris was first brought into public consideration by Raymond Orteig, who in 1919 *issued a* challenge *to the aeronautical world by offering a prize of* $25,000 *to the first successful entrant. . .*

The flight was not undertaken for the purpose of making money. Its main object was the advancement of aeronautical science.

—LINDBERGH.

CHAPTER ONE

THE CHALLENGE

WHILE "Slim" Lindbergh was winging his way to Paris, an old man was rushing in a special train from his country home in France to greet the intrepid flyer. He was too late for that tumultuous welcome at Le Bourget, but when a day or two later Raymond Orteig greeted Charles Lindbergh it was with great cordiality, for Raymond Orteig it was who had conceived of the flight from New York to Paris as a token of friendship between his native land (France) and his adopted country (America), and because of his interest in the aviators of the two countries.

"I feel lots lighter," Orteig told the reporters. To a facetious "In your pocket?" under the witchery of his meeting with the man who had made his dream come true Raymond Orteig's answer came pat: "No, in my heart."

"You certainly started something," Lindbergh told him at that meeting, "when you offered that prize"—the prize of $25,000 for the first non-stop flight from New York to Paris. For eight years it had stood as a challenge to aviation.

The Orteig challenge was made in March 1919. Lindbergh was then seventeen years of age. It was not until three years later that he had his first ride in a flying machine. Did he dream as he followed his father's plow, or as he raced his motorcycle along the streets of Little Falls, Minnesota, that he would be the knight to pick up that gauntlet and answer its challenge?

Probably not, for although to practical aviators the possibility of so long a flight seemed then somewhat remote, this lad to whom the airways were already calling must have felt that the Orteig challenge could stand at most but a year or two. In June of that year (1919), Capt. John Alcock, a British pilot, with his American navigator, Arthur W. Brown, answering an older challenge, flew the Atlantic from St. Johns, Newfoundland, to Clifden in Ireland, and New York to Paris must have seemed but a few steps removed. And . . . Charles Lindbergh was ever a doer, not a dreamer of day-dreams.

The four years of the war had given aviation a tremendous impetus. Day after day something was added to the design and power of the airplane, and thousands of highly skilled and resourceful pilots were being developed. With the end of hostilities, aviation had to make a fresh start. Designs had to be adjusted to meet the requirements of peace con-

ditions. In war the fighting value of planes was of paramount importance. Peace required a high factor of safety, and a demonstration of the utility of airplanes in commercial undertakings.

Slowly and surely aviation's value in practical transportation began to be developed. Europe began to be networked with passenger lines, America with mail routes. The fever of war-time development was over, but in every department of aviation steady progress was made as the many records in flying and the advance in the science of air navigation between 1919 and 1927 testify.

The first to accept seriously the challenge of the Orteig prize was the French Ace of Aces, Capt. Rene Fonck (he had been credited with bringing down 126 enemy planes). In 1926 a giant Sikorsky biplane was specially constructed for him, and in September of that year he made his ill-fated attempt to span the air between New York and Paris. His partner in the flight was Lt. L. W. Curtain of the United States Navy. The plane also carried a radio operator, Jacob Islanoff, and a mechanic, Charles Clavier. A start was made from Curtiss Field, Mineola, Long Island, but the plane starting down-wind failed to take the air at the end of the runway, tumbled into a gully and caught fire. Fonck and Curtain extricated themselves with

great difficulty from the burning wreck, but Islanoff and Clavier perished in the flames.

When lives are lost in a worth-while endeavor the interest in it is only accentuated, so that the Fonck disaster became in effect a double challenge —a double challenge to designer, engineer, the host of others who play a part in the making of a modern airplane, and, most of all, to the airmen whose business it is to fly the ships the others make. To them the difference between success and failure frequently is the difference between life and death. Quite apart from the fact that New York to Paris was a longer distance than any airplane had traversed in a non-stop flight, and that fine skill was required in taking such heavily loaded planes into the air from our limited runways and keeping them flying the first few hours, it should be remembered that the problem of navigation through the treacherous air spaces of the Atlantic, with its ever present menace from fog and rain and sleet, challenged the pioneering instinct of our airmen.

The men who have written their names in the history of the air have always been spurred by such a challenge as this. Many began to prepare their answers—Commander Noel Davis in the Naval Air Service, Commander Richard E. Byrd fresh from his triumph of flying over the North Pole, Capt. Fonck with his plans for a second attempt,

many noted French airmen hoping to make a westward flight, *a young unknown called "Slim" Lindbergh, flying the mail between St. Louis and Chicago.*

So when the spring of 1927 came round with its promise of fair weather over the Atlantic, it appeared probable not only that aviation would answer its eight year old challenge, but that something approaching a "race" for the honor of being the first to make the great flight would result.

CHAPTER TWO

THE UNKNOWN

THE PUBLIC has always been fascinated by these great air occasions. The newspapers follow the preparations in careful detail, and assign their best reporters to cover them. Either success or failure provides sensational news.

And the transatlantic "race" was no exception. One thrill followed another. Byrd's giant Fokker on its trial flight, with its designer at the controls, hit a bump in landing, and turned over on its nose, seriously injuring Floyd Bennett (Byrd's pilot-partner in the great North Pole adventure), who had been chosen to pilot it, and dislocating Byrd's left wrist. Commander Noel Davis, in his final weight-lifting tests, had to make an emergency landing. He ran along a field and nosed into a shallow swamp, the great weight of the plane plunging him and Lt. Wooster under water, with fatal results. A new contender now suddenly appeared on the scene. The Bellanca monoplane *Columbia* piloted by Clarence Chamberlin and Bert Acosta, flew 51 hours and 11 minutes in an endurance test, establishing a world record. It

was immediately entered and became the favorite for the New York-Paris honors.

And then came the most touching tragedy of this attempt to link New York and Paris by air. The French are justly proud of their progress in aviation. The Bellanca monoplane was ready and waiting on good weather, when Capt. Charles Nungesser, a noted war ace (he had been wounded sixteen times), with his navigator, Major Francis Coli, took their *White Bird* into the air in a gallant attempt to win for France the honor of the first flight between New York and Paris. Serenely the white plane, painted with Nungesser's fighting insignia, the skull and crossbones, sailed over Paris, its nose pointing west. Over the Seine, to give themselves better air speed, they dropped their landing gear and passed out to sea and a fate that is still in doubt. France waited tensely for news. Thousands gathered at the Battery in New York to welcome the flyers. A false report of their landing in New York was received in France with the wildest enthusiasm. Hour after hour passed without authentic word of their being sighted anywhere, but the world clung to the hope that by some miracle the airmen were safe—for only a miracle could have saved their lives. France was cut to the heart.

Nobody bothered about Charles Lindbergh. Few

had even heard of him. A few hundred had heard of him vaguely as the "mystery" entry for the transatlantic flight. One eastern newspaper carried a little note to the effect that the only pilot properly entered for the Orteig prize was a Capt. Charles A. Lindbergh, a mail pilot of St. Louis, but that nothing was known about him or his plans.

On May 10th the world was still dazed with the Nungesser tragedy. The Bellanca was in its hangar ready but weather-bound. Commander Byrd with Bert Acosta as pilot in place of Floyd Bennett, still in the hospital from the injuries received at the plane's trial flight, had but a few more tests to complete before the *America* would be ready for the airway to Paris.

Then suddenly the telegraph began to buzz with the news that Charles Lindbergh, flying alone in a Ryan monoplane, had left San Diego, California, for St. Louis en route for New York.

Straight as an arrow, a silver streak in the sky, the Lone Flyer came on. Flying by compass over the Rockies at night, when dawn broke he identified his position only twenty-five miles out of his course. At 8:20 he had landed at St. Louis after 14 hours and 25 minutes of flying.

St. Louis is Lindbergh's home, his backers were St. Louis men. St. Louis looked upon pilot and plane as its own peculiar enterprise. Amidst scenes

of the greatest enthusiasm the monoplane was christened *The Spirit of St. Louis.* On the morning of the 12th, Lindbergh left St. Louis. Seven hours and twenty minutes later he had landed at Curtiss Field, Mineola, Long Island, having incidentally established several records in his cross-continent flight.

Lindbergh was in the transatlantic "race" with a vengeance!

CHAPTER THREE

"THE FLYING FOOL"

THE PUBLIC insists on its own illusions. The Lone Flyer, with his two dazzling hops, fired its imagination. Lindbergh was the mystery man. His plane, with its enclosed cabin, added a touch that astonished even the trained aviator. His rivals were men of great public reputation—Lindbergh, except to his circle of friends, was unknown. His slim boyishness gave this dazzling enterprise, with its memory of a triple tragedy, a touch of poignancy.

The public was willing to believe the impossible. Lindbergh's confidence and his courage impressed them. The careful preparations, the sound reasoning on which every step was based, the training that made him, of all entries for this high honor, the most peculiarly fitted to undertake this colossal enterprise they knew little about and cared less. This was sensation they delighted in. Vague word went about regarding his flying adventures, of his unique four-time membership in the Caterpillar Club, that exclusive organization of men saved by parachute jumps from disabled planes. The superhuman presence of mind, the swift judgments that

made these miracles possible they were still to learn.

To the public Lindbergh's enterprise was a gallant youth's gesture to fate and fame. The Boy spelled romance. To mystery had been added drama, to drama a most appealing personality. Absurd stories began to flit about—stories of the risks he took and of his lack of preparation for the flight. It was rumored that the only map he had for navigation was an old one torn from a school geography! "Lucky" they called him, and what was worse, "The Flying Fool."

The moment Lindbergh stepped out of the enclosed cabin of *The Spirit of St. Louis* he became the sentimental favorite for the transatlantic honors. Interest followed his every movement. But he was moved neither by sentiment nor the overcautious fears many expressed as to the possibility of a lone man standing the great strain of the flight even with the best of equipment and preparation. Untouched by fear or adulation he went about putting the finishing touches to his preparations, checking his engine and instruments, while he waited for word of good weather. His mother came on from Detroit to wish him "God-speed" and a final "Take care of yourself, Charles." He met the other flyers, gave an interview or two, posed for the insistent photographers, and renewed

a few acquaintances. Lindbergh the boy still knew how to have a good time. One evening he spent at Coney Island enjoying all the "thrills" of the midway.

Two incidents during that week of waiting illustrate the confidence and modesty of the Lone Eagle. He armed himself with an order on a shipping company for the return passage for himself and his plane from France, and with a draft for his expenses while in Paris. Seeking the good offices of Col. Theodore Roosevelt, he fortified himself with letters of introduction to the American Ambassador and a few others—the letters vouching for him personally since he had never been on the other side and would be unknown there. Knight of the air, riding for the name of his good lady Aviation, he had no thought of fame, of being lionized, following his flight.

The morning of Thursday May 19th, 1927, it did not seem likely that there would be the break in the weather for which Lindbergh waited. He flew over to the Wright factory in New Jersey, and planned for that evening a visit to the theatre. Late that afternoon word was received of the weather clearing up along the great circle route which Lindbergh was to follow. The theatre party was abandoned, and towards midnight it was

finally decided to take off the next morning. Lindbergh retired at 12 leaving a call for 2:15. He hardly slept for he had many things to do. At three o'clock he was at the hangar where the tanks of *The Spirit of St. Louis* were being partially filled with the special high-test gasoline Lindbergh was to use for his flight. Shortly after it began to rain heavily, later dropped off to a drizzle. It ceased about four.

Although word had not gone out until rather late at night that Lindbergh was likely to start the next morning, a crowd had already begun to gather around the hangar. The plane was wheeled out, its tail lifted onto a truck and hauled, accompanied by a motorcycle escort, to the runway. As Lindbergh came out of the hangar a cheer went up. In a closed car he made his way to the runway at Roosevelt Field.

The runway of Curtiss Field adjoins Roosevelt Field. The ground had been leveled off, to make a clear run of 5000 feet of the two. The nose of *The Spirit of St. Louis* was pointed east—towards Paris and into the wind. Here the plane took on the balance of its full load of gasoline—451 gallons, making a total weight of 5150 pounds with which the plane was required to take off. While this was being done the crowd grew. It drizzled intermittently.

But finally everything was ready. Lindbergh put on his flying suit and donned his helmet. The 200 HP Wright Whirlwind motor was started and roared her song. Lindbergh climbed into the cockpit, and played with the throttle. The engine raced and quieted at his touch. Somebody asked him if it was true that he was carrying only five sandwiches and two canteens of water.* "Yes," he nodded. "That will be enough." Then he beckoned to the field engineer of the Wright Company.

"How does she sound?" he asked.

"She sounds mighty good to me," was the reply.

Again the engine roared. Lindbergh waved his hand to the mechanics and the chocks were removed. Along the soggy runway the plane started slowly.

In her tests at San Diego *The Spirit of St. Louis* had taken the air with a load of 4,200 pounds in 1,023 feet. Pilot and designer, who knew their plane, were confident it would take the air without difficulty. To those who watched the plane gather headway, lurching slightly on the wet runway, it seemed as if the tiny monoplane would never rise, that it was earth-bound. At the end of the runway was a tractor, then some telephone wires, then a little hill with some trees.

Would Lindbergh clear these obstacles? Failure meant . . . the watchers held their breath. At

*This did not include his emergency rations.

about the 4,000 foot mark daylight began to show under the wheels. The onlookers breathed a deep sigh of relief. It seemed to them that the obstacles, one after the other, were cleared by the narrowest margin—that only the sheer will of this fair-haired boy had lifted his plane to safety.

Lindbergh himself disclaims any sensation in that take-off. At the halfway mark it was evident, he says, that the plane would make it. The obstacles were cleared by ten and fifteen feet respectively, with a fair reserve of flying speed. "I was careful," he writes, "not to take unnecessary chances. I kept out of the way of every obstacle." He believes that with a hard ground the plane would have taken off with an additional five hundred pounds.

Clearing the hill he immediately took up his compass course, already set for the first leg. The engine throttled down, was doing over a hundred miles an hour, and gaining some altitude.

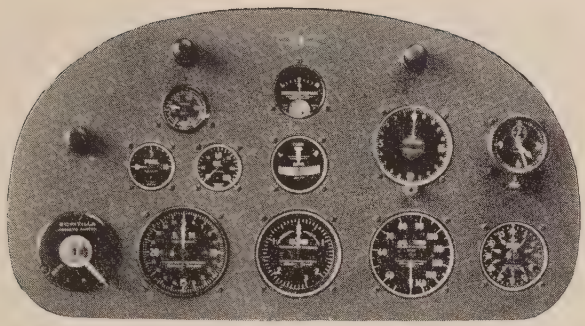
Lindbergh—"The Flying Fool" still—was on his way to Paris!

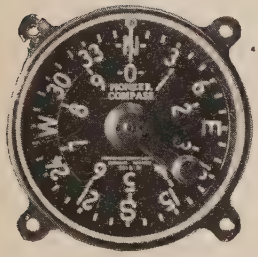
CHAPTER FOUR

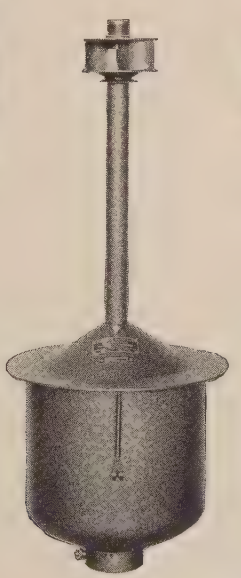
THE PERFECT RESPONSE

HOW LONG is thirty-three and a half hours? To Lindbergh concentrated on his instruments, checking his position, altering his course every 100 miles, fighting the fog and snow and sleet, time was lost as he grappled with his problem. "I was surprised to find how close Europe was to America," he said with a smile. He never felt downright sleepy though he may have nodded a few times. He even forgot to be hungry or thirsty. He ate only a sandwich and a half in all those hours, taking a swig of water from his canteen once or twice.

But to the millions who waited for word of the Lone Flyer winging his way the day, the night and the day that followed seemed endless. The French, ever sensitive to the gallant gesture, waited word with mingled fear and hope. "If the 'Flying Fool' makes it," said a noted French aviator, "it will be nothing short of fantastic." England was equally touched and equally skeptical. Lloyds, the great insurance combine that will quote rates on any undertaking, reported the risks so great that no







Courtesy Pioneer Instrument Company

The Instrument Board of THE SPIRIT OF ST. LOUIS, and the three parts of the Earth Inductor Compass.

International News Reel

What La Borget looked like just before the Paris crowd went wild with enthusiasm.

terms could cover it. To them it was suicide. To America in those thirty-three and a half hours all life seemed bound up in the hope that the impossible would be accomplished, in the fear that it would not. "Experts," whose opinions were sought, stated that the strain would be too great, that apart from all the other dangers, no man could go sixty hours under such circumstances without sleep.

The first leg of the journey, from New York to St. John's, N. F., was comparatively safe. A long part of it was over land. The chief danger came from the ability of the plane to hold such a heavy load in the air. Lindbergh had the utmost confidence in it, and a good part of the journey he was flying low, just clearing water and trees by a safe margin. The heavy tank of *The Spirit of St. Louis* had a special pet-cock which would, in an emergency, drain it of most of its weight in a minute. Over *terra firma* Lindbergh could make a landing, however hazardous, if the worse came to the worst. He had considered all these factors. The first leg was important in that it would give him his final test of the functioning of the plane, and especially of the Earth Inductor Compass on which he placed his full reliance for navigation.

As he headed for Cape Race, word of him began to be flashed round the world from points over which he passed. He was keeping his course

and his schedule like clockwork. Soon after the take-off he had throttled down to three-quarters speed but the escorting planes that had left him over Long Island reported him as making better than one hundred miles. Straight as a swallow the silver bird headed across southwestern Massachusetts, and at Scituate began its first water jump —nearly three hundred miles—to Nova Scotia. At 12:25 he was reported at Meteghan—exactly at the point he had aimed. Flying across Nova Scotia he was reported at several points. At 5 P. M. he was seen at Main Adieu heading out for his second water jump, also nearly three hundred miles, to Cape Race. Eager watchers at St. John's saw the plane come up the harbor and circle several times and then set out to sea. The inference was that he had missed Cape Race because of the fog, and picked up St. John's to make sure of his location, and pilots marvelled at his being out of his course only three miles at the end of a thousand. Actually he had hit Cape Race "on the nose" and gone out of his way to St. John's to make sure that he had been seen, so that in case he was lost it would be certain that he had set out to sea! This was 7:15 P. M., New York time.

That night—May 20th—Europe and America waited in an agony of apprehension. Thousands spent a sleepless night—thousands prayed for the

Lone Flyer winging his way over the treacherous Atlantic. Forty thousand fight fans in the Yankee Stadium at New York greeted the news that Lindbergh had been seen three hundred miles out at sea with a shout that echoed the announcer's "he's the greatest fighter of them all!" At a word the entire crowd came to their feet and bared their heads in silent prayer for the flyer alone over the Atlantic. In Paris crowds hung around the bulletin boards, in hope and fear. "We wish him luck and a happy sky," one prominent Frenchman said in a nice felicity of phrase.

After the word from the *Empress of Scotland* that he had been sighted at 12:10 A. M. on the morning of the 21st there was no word for seven hours, and then the telegraph began to sing with the wirelessed words from the steamer *Hilbersun* that she had sighted *The Spirit of St. Louis* five hundred miles from the Irish coast. At 12:10 he was reported over Dingle Bay, within three miles of the point he had aimed at.

Crowds everywhere were jubilant. He was over land, and succeed or fail, he was safe!

Meanwhile what of the flyer? The course to St. John's had been comparatively simple. There were a number of points at which the route could be checked, and the weather turned out to be a little better than Lindbergh had expected. From St.

John's to Ireland, a little less than 1,900 miles, there would be no landmarks to check his course. The route had been laid out with a change in the course every hundred miles. The Earth Inductor Compass was his navigator. On it he placed full reliance. All he had to do was to judge when he had gone a hundred miles (his air speed minus or plus the head or tail wind he would encounter), to make the correct adjustment (allowing, of course, for any drift that might occur by a side wind), and keep the needle of the compass pointing at zero—All! Drift meant of course checking frequently by getting a sight of the white caps breaking under him showing in what direction the wind was blowing.

In addition to the navigating he must keep a constant eye on every instrument on his dashboard.

With the night and foul weather there must be unremitting vigilance.

Shortly after leaving Newfoundland night had fallen, and with it came cloud banks. For about twelve hours *The Spirit of St. Louis* had to buffet weather that was so bad that for a swift moment Lindbergh thought of turning back. Once the sleet in the wet clouds began to form on the wings of the plane so fast that Lindbergh opened the throttle of the engine full to dart above it ten thousand feet or more. Sleet is the airman's most

deadly peril, for it forms quickly on the plane, and by changing the camber of the wings (that is what gives the plane its lifting power) brings the plane down in a few minutes.

As he flew on and on, the storm became worse. To the necessity of watching the instruments he had to look out for this peril, which might have seemed, if he had that kind of imagination, like a million hands above, below and round him waiting to clutch and drag him down. He had to be every instant on the alert—now making a detour, now diving to within a few feet of the water, now climbing rapidly. There were periods when the fog spread over a wide area, forcing him to go through. For two hours at a stretch, and frequently for shorter periods, he flew "blind," by instruments alone, for the sky, sea and even the wing tips of the plane were shut out by the thick fog.

"We hadn't expected that at all," he said in writing of the bad weather he encountered, "and it sort of took us by surprise, morally and physically."

But not enough to lose track of the course, to watch the breaking of the white caps, when he had the chance, or to judge his speed and watch his instruments!

His course lay across Ireland, across the toe of

England at Plymouth, and over the English channel to Cherbourg. The Saturday crowds received each word of his being sighted, with enthusiasm and anxiety. All occupation was abandoned. Rumors filled the air. Reports came of his being escorted over the channel by a fleet of British planes. Wild and irresponsible rumors were flashed about, even of his landing, all afternoon.

But the Lone Flyer was winging his way steadily across the last bit of water that separated him from his goal. He came into view at a great height over Cherbourg just as the light was fading—3:20 New York time. Two hundred miles to go! There was a crowd at Le Bourget already, increasing every minute. Before every newspaper office in America there was a growing crowd cheering every bulletin with news of the flyer.

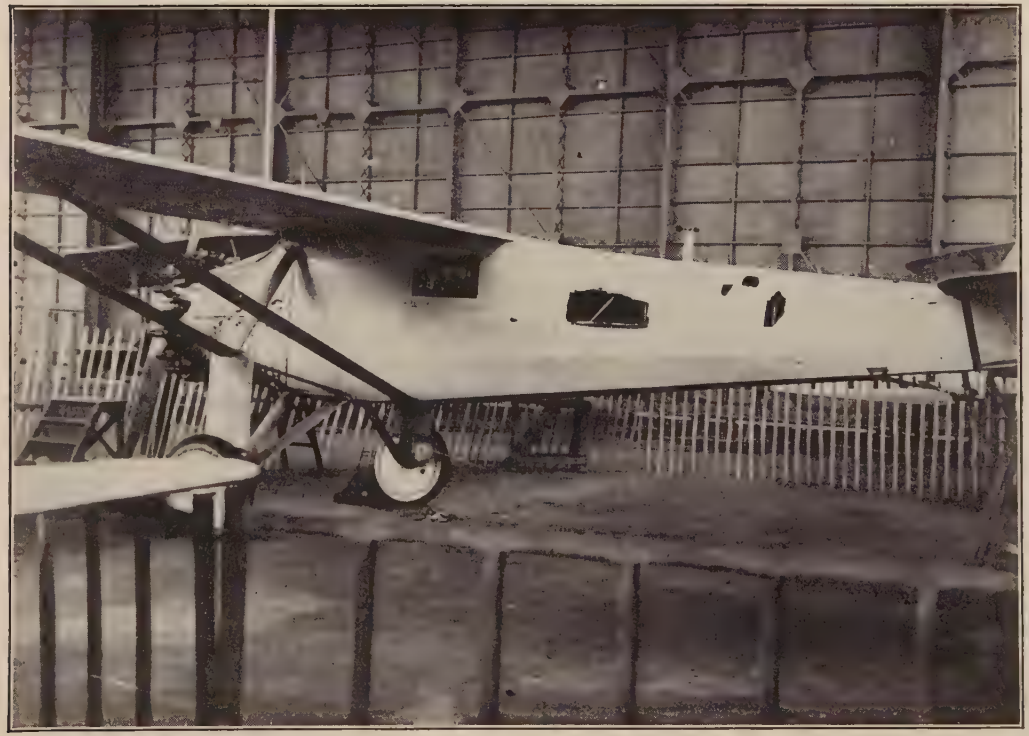
Picking up the Seine, Lindbergh followed its course to Paris. The bright lights of the Eiffel Tower were a sure landmark. He circled Paris once to make sure of the landing field, cut the engine that had beat faultlessly for thirty-three and a half hours, and made a perfect landing some distance from the crowd. Even as the Paris crowd was tearing at the railings and sweeping soldiers and policemen before them as they raced, a great mob of one hundred thousand people to greet him, the telegraph was carrying the news all over the world.

America was stunned with joy and relief.

No coherent account of that historic landing and reception at Le Bourget has been written. Lindbergh himself wrote, and we can see him smile as he did it, "Incidentally that reception I got was the most dangerous part of the whole flight. If wind and storm had handled me as vigorously as that reception committee of fifty thousand (was it one hundred thousand or one hundred and fifty thousand?) I would never have reached Paris." We have seen at least three different claims from the first Americans to greet the flyer. Palpable absurdities filled the papers from "eye-witness" correspondents. "Those first to arrive at the plane," says one, "had a picture that will live in their minds for the rest of their lives. His cap off, his famous locks falling in disarray around his eyes, 'Lucky Lindy' sat peering out over the rim of the little cockpit of his machine." This despite the fact that the enclosed cockpit, without a forward view, was one of the features of *The Spirit of St. Louis.* Even the first words he used were in dispute. "So this is Paris." "I did it." "Does anyone speak English?" and finally, "I am Charles Lindbergh" reported to be from the flyer himself as he went out to meet the crowd madly racing towards him. Lindbergh concentrated over his dials and instruments for thirty-three hours was conscious least of all of the stir he had been making in men's hearts!

With one single-willed movement, the crowd, seeing *The Spirit of St. Louis* about to land, tore up the spiked iron fences and swept the regiment of soldiers and the extra detail of police before them. Soldiers and policemen fought to make a ring around the aviator, and again and again were swept aside by the surging crowd. One man trying to make a way for the aviator with his stick, struck Lindbergh as he brought it back over his head. Souvenir-hunting vandals tore strips of canvas from the plane. It was two French aviators who saved him by a ruse. For half an hour the crowd had carried him here and there, not knowing what it wanted to do. Throwing a cloak around Lindbergh, the French aviators stuck his cap on an American in the crowd, slapped him on the back with a "*Vive* Lindbergh!" and the crowd bore the stranger, clothes torn and battered, to the Reception Committee, while Lindbergh was spirited away to a hangar, and later in a car to the American Embassy by a roundabout route, the main highway between Le Bourget and Paris being jammed with cars and becoming impassable for hours.

Five minutes after the landing the news of Lindbergh's triumph was winging its way across the American continent. Theatres and motion picture houses stopped their programs while the audiences



Wide World

The marks left by Parisian souvenir hunters on THE SPIRIT OF ST. LOUIS.

Wide World

Lindbergh with the President of France and Ambassador Herrick.

indulged in wild bursts of cheering. Factory whistles, fire engines, automobile horns, steamer sirens screamed his triumph to the night.

Lindbergh's dazzling accomplishment—perhaps, all things considered, the greatest feat undertaken by a single man—in a moment seemed to lift everybody into a feeling of ecstacy. That crowd at Le Bourget was not unique in its feeling of delirious elation. "One only had to venture into any city street," said one, "after the news of Lindbergh's landing, to notice that for a little while the aspect of the world and its people had magnificently altered."

"It is fantastic," said a noted French airman.

"It makes me a little prouder," said Commander Byrd, "to be an American."

Lindbergh had in the thirty-three and a half hours of his flight and its moment of triumph given the world a glorious sense of victory. Think of it! Alone through 3,600 miles of air in a tiny ship—New York to Newfoundland, Newfoundland to Ireland, Ireland to Cherbourg, Cherbourg to Paris—faultless flying, from perfect beginning to perfect end! No wonder the world grew a little delirious as it contemplated this single-handed feat of so young a man.

In the Ambassador's pajamas (he carried no baggage) Lindbergh, sixty hours without sleep,

was giving frantic newspaper correspondents a few words on his flight. The interview lasted seven or eight minutes. In a few more Lindbergh was sleeping like a child. The only effects of the superhuman endurance, apart from the fatigue, was thirst. After the landing he drank several glasses of milk and water.

A few minutes later there was winging a message to the flyer's mother in Detroit:

> "Warmest congratulations. Your incomparable son has honored me by becoming my guest. He is in fine condition and sleeping sweetly under Uncle Sam's roof."
>
> MYRON T. HERRICK.

The Knight of the Air had made his perfect response to that eight-year-old challenge!

PART II

THE HERO ACCLAIMED

CHAPTER FIVE

EUROPE

WHEN Charles Lindbergh awoke at one o'clock the next day—Sunday afternoon—he was the most famous man in the world. Telegrams of congratulation had piled up in the Embassy from all parts of the world. Kings and Premiers were exchanging felicitations with the President of the United States. Invitations to visit this country and that were pouring in. Correspondents of every big newspaper and news agency were kicking their heels waiting the hour when he might see them. Outside the Embassy a crowd, growing every minute, waited for a glimpse of the hero. Sir Alan Cobham, Britain's most famous flyer, had hopped over from London to congratulate the Lone Eagle. Movie and other interests were there to beg his signatures to fat contracts.

In the meantime an insatiable appetite developed for news regarding the flyer. Everything that Lindbergh had done or had said began to assume significance. Files of the newspapers began to gather with word from all over the country, wherever

Lindbergh's roaming air experience had taken him. "Lucky" began to take on a new complexion. Five crowded years of flying with every imaginable experience began to filter into the public knowledge. The public began to get some understanding of the minute, careful plans with which the flight had been undertaken.

But these interesting and enlightening facts were dwarfed by the happening in Europe. Everywhere the Lone Eagle appeared, Le Bourget and its mad enthusiasm was repeated—not by crowds alone, but by statesmen and peers.

It is the purpose of this book to show that step by step Lindbergh had been prepared for the great feat which brought him fame. Step by step he had advanced from boyhood through his flying experience in a way that not only peculiarly qualified him for the great undertaking, but had made the Paris flight a logical enterprise for his skill and daring.

But fame took him unawares. Men with years of public training have lost their heads in half the glare of adulation that beat down on Lindbergh. Mature men and women, with a quarter of the attention he received, have become drunk with its flattery and staggered out of its favor. A man who three or four days before, after careful saving for years, had been able to save two thousand dollars, suddenly found millions beckoning to him if he

would only put his signature to a piece of paper and let others exploit his notoriety. Decorations and medals were showered on him. Could he stand with the great ones of the world and keep his endearing simplicity? Could he "walk with kings, nor lose the common touch?" A prince is trained for such things from birth, and frequently makes a hash of it. Could a raw Minnesota lad stand the strain?

We dislike the word "miracle" for it is too frequently the explanation for what ignorance fails to or cannot understand. But of the two miracles, surely this is the greater, for it took him without preparation. Flying the Atlantic was, first of all, a test of skill and endurance; here was a greater test, a test of character. That an American boy should have met it with such simple, easy grace, is a matter of pride. Without any previous experience, called upon to speak constantly in public, he responded with such direct simplicity as to charm everyone who heard him. By the time he had returned to America, every mother, every father, saw in him not only the daring, the courage, the perfect accomplishment—but the symbol of their own hopes for their boys.

Europe, rent by bitter feelings toward America, saw again in the slim fair-haired youth the spirit of 1917. Distrusts flew—American flags crowded the

streets, and with the cheers for the Lone Flyer came cheers for America. In a moment a whole sea of mistrust calmed over into kindly feelings. Lindbergh became to Europe the symbol of America.

We have called him the Knight of Aviation and there is no more fitting description of the attitude he brought to the task, and of the spirit with which he met the tremendous trial to which he was subjected. What young knight of the Middle ages in shining armor remembered his promise of knightly honor as Lindbergh the good name of flying? What good knight returning from the joust with his lady's favor treasured it so carefully as Lindbergh did the cause of aviation? What knight who had sworn on the cross of his sword to serve his country, brought such good will as Lindbergh did to his own? Lindbergh is not given to flavory phrase. In his simple, direct way, he said the "flight was undertaken for the good of aviation," and that if it meant that he would have to give up flying the transatlantic flight would not have been undertaken.

The simplest record of the twelve full days that Lindbergh spent in Europe, the tact and charm with which he met every situation, the crowded honors that were showered upon him, would fill a book. The Sunday afternoon when he awoke after twelve hours of sleep, a palpitating and anxious

group of correspondents awaited him at the Embassy—outside a crowd had begun to gather for the hour when the most talked of man in Paris would show himself. One expression of Lindbergh's story, and he treated the correspondents with the same grace and tact he had towards all, mystified them. During the talk of his flight, which followed quickly on the American breakfast the Ambassador had Paris searched for, Lindbergh spoke simply of "We" doing this, and "We" doing that. In a little while it began to dawn on them that to him *The Spirit of St. Louis* was not a thing of wood and metal and spitting cylinders, but a live, animate companion, who had shared the great adventure with him. That practice, which he continued, gave an inkling of the real man, and added another bit of light to dispel the "lucky" and "Flying Fool" legends.

The first wish he expressed that day was a desire to "hop over" to London and talk with his mother over the transatlantic 'phone. But telephone communication rose to the occasion. A connection was made between London and Detroit and relayed to Paris, and Lindbergh added another record to his credit—the first man to talk from Paris to America.

To repeated cries for him from the crowd growing around the Embassy, Lindbergh came out on

Wide World

As Paris first saw Lindbergh in daylight. On the balcony of the American Embassy.

International News Reel

The stone that marks the spot of Lindbergh's historic landing at Le Borget.

the balcony. As he stood there—the first time he had stood before the people of Paris—the Tricolor in one hand and the Stars and Stripes in the other—Paris took him to her heart, and he became the symbol of the united friendships of the two great peoples. That note set aflame the heart of the people of Paris—sensitive always to the gallantry of the brave and splendid thing—and on Lindbergh's part everything that he did showed that no finer Ambassador could have been chosen to show the people of France American affection for and admiration of that great people. Nungesser and Coli had failed where he had succeeded, but, Lindbergh pointed out, theirs was a much more difficult task. His first public act was to visit the mother of Charles Nungesser, whom Lindbergh had known in New York, and to comfort her in the loss of her gallant son. When he met Bleriot, who in 1909 had flown the English Channel, and was himself the hero of that day, Lindbergh hailed him as master. He visited the blind and crippled veterans of the Great War. He had expressed a wish to fly a French pursuit plane—machines of great speed and maneuverability, used only for combat—and when it was offered him he climbed in without any hesitation, and put it through every maneuver that is asked of such a plane, to the delight of the aviators present who watched him, and the anxious

admiration of the people of Paris up early enough to see him.

All these touched France even more than his flight had done. His flight had won their admiration; his poise, tact and charm took their hearts by storm. President Doumergue pinned the medal of the Legion of Honor on the lapel of his borrowed suit. Marshals Foch and Joffre, Foreign Minister Briand, dignitaries of the War Office, noted statesmen and generals grew excited about him, as did the midinettes and workmen who lined the streets in thousands, who rushed to touch his hand, to call out his name. Half a million people lined the streets when he went to receive the Medal of Valor of the City of Paris. Dinners and receptions he faced with the same easy grace. At the dinner of the Aero Club of France, a brilliant gathering, surrounded by France's greatest aviators, he was called upon to make his first speech. His tribute was again to Nungesser and Coli, and the greater feat that they had attempted.

At the luncheon at the American Club he made his second speech. In his simple direct way he said, "Gentlemen, 132 years ago Benjamin Franklin was asked: 'What good is your balloon? What will it accomplish?' He replied: 'What good is a new-born child?' Less than twenty years ago when I was not far advanced from infancy M. Bleriot flew across

the English Channel and was asked, 'What good is your airplane? What will it accomplish?' Today those same skeptics might ask me what good has been my flight from New York to Paris. My answer is that I believe it is the forerunner of a greater air service from America to France, America to Europe, to bring our peoples nearer together in understanding and in friendship than they have ever been."

Lindbergh said a little ruefully shortly before he left that there were many things in Paris that he would have liked to see, but that so far he had been too busy thinking up speeches. Only an iron constitution could have stood up against the demands made on him in those twelve days. Telegrams and letters came in an avalanche. It was characteristic of him that he wanted to read and answer every one of them, but this was an impossible task. Even the Embassy staff was swamped, and the work of opening and taking care of his mail was taken over by one of the banks.

Lindbergh had made two promises to France. The first was that he would let Paris see him and his plane (the celebrated "We") in the air, the second that no matter where he was when he came to leave for home, the last European soil he would stand on would be France. When at noon on May 27th, after getting *The Spirit of St. Louis* ready for

flight, he took off for Brussels, he kept the first of these promises. The little silver ship circled the city, and twice around the Eiffel Tower, then swooping low he released a message to the people of France for the kindness with which they had treated him.

The airway to Brussels lies across the scenes of many famous battlefields of the Great War. What gallantries of flying had been enacted there! Had Lindbergh been a few years older he too doubtless would have left his mark and written his name in the French sky. Did he think of this, as he flew towards Brussels?

Fifty thousand people waited at Evere Airport to welcome the flyer. Two regiments of soldiers policed the field. King Albert had given special instructions that under no conditions was Lindbergh to be touched. But they could cheer!

At the head of the Reception Committee was the Prime Minister. In a short speech he welcomed the Lone Flyer and escorted him to a closed automobile. The crowd, released, raced to see the famous plane, or to follow the flyer to the Embassy. Thousands lined the route, a vast cheering mass, as he went to place a wreath at the grave of Belgium's Unknown Soldier. His progress to the Naval Palace to meet the heir to the Belgian throne, and later to the Royal Palace became a

triumphal procession. King Albert decorated him with the Order of Leopold and presented him to Queen Elizabeth. King Albert is a flying King. Flying is his favorite mode of transportation, and Queen Elizabeth has flown many times with her royal husband. Secretly they made a date with Lindy for the next morning. They wanted him to show them his plane. Early next morning the royal pair were shown the historic plane and were deeply interested in the controls and instruments and the story of the flight from Lindy's own lips. Both King and Queen asked permission to try the pilot's seat. So "Slim" helped them into its tiny cockpit. The Queen insisted on taking several pictures of the pilot and plane, and on his posing with the King. Lindbergh had charmed the people of Paris, the statesmen and generals and distinguished men of France, and now royalty found in him that same irresistible appeal. "I am sure your mother is proud of you," the Queen told him, "and that she is the happiest woman in the world."

And after Brussels — London. The English are rather scornful of the emotional Frenchmen. Their pet pride is the London "Bobby". A handful of policemen, no matter what the occasion is, has always sufficed to control the crowd. Careful preparations had been made for Lindbergh's reception. Sixteen hundred policemen had been assigned to

duty there. Lindbergh would land, and taxi along the field before the crowd to the Reception Committee. Everything would be done in beautiful order.

When *The Spirit of St. Louis* came into view of the field, however, the crowd variously estimated at between 100,000 and 200,000 in one moment swallowed up policemen and Reception Committee. They were mad to touch him and his plane. Lindbergh's first concern was for the safety of his plane. A ring of policemen strove to surround him, and were blown about like feathers in a storm. He took refuge in a building. The crowd milled in front of it and would not disperse. They called for a word from him and he finally gave it to them through a megaphone. "I just wanted to say that this is worse than Le Bourget — or better."

Again by strategy he was rescued and taken to the American Embassy, where a crowd almost as large was waiting to cheer him.

Early next morning he was at the airport examining his plane. The damage again was fortunately slight.

London was a repetition of Paris. He attended a Memorial Day Service, placed a wreath on the tomb of Britain's Unknown Soldier. For fifteen minutes he chatted with the King, who bestowed on him the Flying Force Cross. When, during the

course of his talk with the Prince of Wales, he was asked what he meant to do he replied, "I will keep on flying." Dinners and luncheons, a tea at the House of Commons given by Lady Astor, a ball, the famous Derby Race — at each place Lindbergh was received with an enthusiasm that no man, native or foreign, had ever before received in England. "You came to us as a great aviator," said Sir Samuel Hoare, the Air Minister, "you leave as a real friend of England." Lindbergh had as usual endeared himself by his tact and charm. At the first opportunity he had to speak he recalled, that through Alcock and Brown, Britain had the honor of the first flight across the Atlantic.

While Europe feted and cheered Lindbergh, America waited impatiently. After all he was ours and we wanted to do a little receiving ourselves. Ambassador Houghton persuaded him, and the President placed the *U. S. S. Memphis* at the flyer's disposal with the invitation that he come home.

The Spirit of St. Louis was crated and taken aboard the *Memphis* at Southampton. Mindful of the promise to France that it was from her soil that he would set out for home, in a British pursuit plane, he flew over to Le Bourget.

The next morning, in a French Nieuport, with an escort of 20 planes he set out for Cherbourg.

He unveiled a plaque at the Marine Railway Station, commemorating the place as the first he had seen of France on his memorable flight. Throngs blocked every available space. As he jumped on the tender, the whistles in the harbor began their salute.

The last word of France Lindbergh heard was the voice of the crowd calling to him, "When are you coming back? When are you coming back?"

Charles A. Lindbergh with His Royal Highness the Prince of Wales in London.

Charles A. Lindbergh as he took shelter in a small lean-to on the aero field at Croydon from the over anxious crowd that mobbed him. Note boy with camera on top of the lean-to.

CHAPTER SIX

LINDY COMES HOME

IF EUROPE'S reception to Lindbergh was an indescribable torrent, how shall one describe America's welcome to her own hero? The *Memphis* cutting through the waves of the Atlantic and making a record trip across the Western Ocean seemed, to the impatient millions, to crawl. America's first greeting to her returning hero was one that must have thrilled Lindbergh. As the *Memphis* came up the Potomac from Virginia Capes the air became alive with aircraft—the giant dirigible *Los Angeles,* Martin Bombers, seaplanes, a squadron of 25 army pursuit planes, that had come up from the army aviation field at Detroit, flying in perfect formation.

The moment the *Memphis* docked, Lindbergh began to realize how close he had come to the hearts of the people. Crowds pressed against the barriers to catch a glimpse of him. Before it was over their desire to get near him, as with the crowds in France, Belgium and England, overcame them. The barriers went over. The Marines, guarding it,

were swept before them, but bv that time Lindbergh was safely in a car.

The first person to come aboard was his mother, and for a moment they were allowed to be alone in his stateroom. Then the Reception Committee. Before the naval and military dignitaries, the Justice of the Supreme Court, the entire cabinet that had come aboard to greet him, observers said he stood somewhat abashed.

A special reception platform had been erected at the Washington Monument. The route to it was lined with soldiers and sailors—with dense crowds that yelled their welcome as he passed. At the Monument, 250,000 people packed the open space around the reception platform. The President, in bestowing the Distinguished Flying Cross on Lindbergh said: "Twenty-five years ago there was born in Detroit, Michigan, a boy representing the best traditions of this country, of a stock known for its deeds of adventure and exploration.

"His father, moved with a desire for public service, was a member of Congress for several years. His mother, who dowered her son with her own modesty and charm, is with us today. Engaged in the vital profession of school-teaching, she has permitted neither money nor fame to interfere with her fidelity to her duties.

"Too young to have enlisted in the World War,

her son became a student at one of the big state universities. His interest in aviation led him to an army aviation school, and in 1925 he was graduated as an airplane pilot. In November, 1926, he had reached the rank of captain in the Officers' Reserve Corps.

"Making his home in St. Louis, he had joined the 110th Observation Squadron of the Missouri National Guard. Some of his qualities noted by the army officers who had examined him for promotion, as shown by reports in the files of the Militia Bureau of the War Department, are as follows:

" 'Intelligent,' 'industrious,' 'energetic,' 'dependable,' 'purposeful,' 'alert,' 'quick of reaction,' 'serious,' 'deliberate,' 'stable,' 'efficient,' 'frank,' 'modest,' 'congenial,' 'a man of good moral habits and regular in all his business transactions.'

"One of the officers expressed his belief that the young man 'would successfully complete everything he undertakes.' This reads like a prophecy.

"Later he became connected with the United States Mail Service, where he exhibited marked ability, and from which he is now on leave of absence.

"On a morning just three weeks ago yesterday this wholesome, earnest, fearless, courageous product of America rose into the air from Long Island

in a monoplane christened *The Spirit of St. Louis* in honor of his home and that of his supporters.

"It was no haphazard adventure. After months of most careful preparation, supported by a valiant character, driven by an unconquerable will and inspired by the imagination and the spirit of his Viking ancestors, this reserve officer set wing across the dangerous stretches of the North Atlantic.

"He was alone. His destination was Paris.

"Thirty-three hours and thirty minutes later, in the evening of the second day, he landed at his destination on the French flying field at Le Bourget. He had travelled over 3,600 miles, and established a new and remarkable record. The execution of his project was a perfect exhibition of art.

"This country will always remember the way in which he was received by the people of France, by their President and by their Government. It was the more remarkable because they were mourning the disappearance of their intrepid countrymen, who had tried to span the Atlantic on a western flight.

"Our messenger of peace and good-will had broken down another barrier of time and space and brought two great peoples into closer communion. In less than a day and a half he had crossed the ocean over which Columbus had traveled for sixty-nine days and the Pilgrim Fathers for sixty-six days on their way to the New World.

"But above all, in showering applause and honors upon the genial, modest American youth, with the naturalness, the simplicity and the poise of true greatness, France had the opportunity to show clearly her good-will for America and our people.

"With like acclaim and evidences of cordial friendship our Ambassador without portfolio was received by the rulers, the Governments and the peoples of England and Belgium. From other nations came hearty messages of admiration for him and for his country. For these manifold evidences of friendship we are profoundly grateful.

"The absence of self-acclaim, the refusal to become commercialized, which has marked the conduct of this sincere and genuine exemplar of fine and noble virtues, has endeared him to every one. He has returned unspoiled.

"Particularly has it been delightful to have him refer to his airplane as somehow possessing a personality and being equally entitled to credit with himself, for we are proud that in every particular this silent partner represented American genius and industry. I am told that more than 100 separate companies furnished materials, parts or service in its construction.

"And now, my fellow-citizens, this young man has returned. He is here. He has brought his unsullied fame home. It is our great privilege to wel-

come back to his native land, on behalf of his own people, who have a deep affection for him, and have been thrilled by his splendid achievement, a Colonel of the United States Officer's Reserve Corps, an illustrious citizen of our Republic, a conqueror of the air and strength for the ties which bind us to our sister nations across the seas.

"And as, President of the United States, I bestow the Distinguished Flying Cross, as a symbol of appreciation for what he is and what he has done, upon Colonel Charles A. Lindbergh."

Pinning the medal on the lapel of Lindbergh's coat the President patted him on the shoulder. The crowd cheered in an ecstasy. A radio announcer broadcasting a description of this event broke down and wept.

What power had this boy that old and young alike should grow mad to touch him, to weep like children, to smile with a joyousness they had seldom known?

Lindbergh responded with a speech simple and direct as usual. "On the evening of May 21, I arrived at LeBourget, France. I was in Paris for one week, in Belgium for a day and was in London and England for several days. Everywhere I went, at every meeting I attended, I was requested to bring a message home to you. Always the message was the same.

" 'You have seen,' the message was, 'the affection of the people of France, for the people of America demonstrated to you. When you return to America take back that message to the people of the United States from the people of France and of Europe.' I thank you."

Lindbergh and his mother were taken directly from the reception to the White House, where he remained as guest of the President, but Washington had only begun to shower its honors on him. That evening at a dinner of the National Press Club, after its President, Mr. Richard V. Oulahan referred to the Press and Lindbergh: "If it is true that through our contacts we are sprinkled with a coating of the dry dust of cynicism, that dust was blown away in a breath," Postmaster General New presented him with the new air mail stamp that had been struck commemorating the flight of *The Spirit of St. Louis,* an honor that has never been accorded to a living man. Secretary of State Kellogg, naming Lindbergh the Department's unofficial embassador, presented him with a printed and bound volume of copies of cables that the State Department had received from foreign governments, congratulating the American Government on his wonderful achievement. The Smithsonian Institute announced that the Langley Medal — its medal of Pioneers that had hitherto been bestowed

only on Orville Wright, Glenn Curtis and Gustav Eiffel — would be awarded to Lindbergh. Among the telegrams was an official message from the British Government expressing to Colonel Lindbergh "in behalf of all the people of Great Britain warm congratulations on his safe return home after his historic flight across the Atlantic." — an unheard of official act from a foreign government in regard to a private citizen. When Lindbergh came on to speak, people in the hall, the millions with whom it was linked by radio, hushed breathlessly. Again he was direct, simple and to the point:

"When I landed at Le Bourget a few weeks ago, I landed with the expectancy and hope of being able to see Europe. It was the first time I had ever been abroad. I had seen a number of interesting things when I flew over Ireland and Southern England and France. I had only been gone from America two days or a little less, and I wasn't in any particular hurry to get back.

"But, by the time I had been in France a week, Belgium a day and England two or three days — by that time I had opened several cables from America and talked with three Ambassadors and their attachés and found that it didn't make much difference whether I wanted to stay or not; and while I was informed that it was not necessarily an order to come back home, there was a battleship

International News Reel

Lindbergh with his scout bodyguard at St. Louis, Missouri.

International News Reel

Lindbergh becomes a member of the Ku-ni-eh, a Scout honor society of Cincinnati, Ohio.

waiting for me." The audience roared with delight as he added: "The Ambassador said this wasn't an order, but advice. So on June 4th," he continued, "I sailed on the *Memphis* from Cherbourg and this morning as I came up the Potomac I wasn't very sorry that I had listened to it."

From now on, wherever Lindbergh had an opportunity to say a word and could do so appropriately he made a plea for the development of aviation.

"There were several things I saw in Europe that are of interest to American aviation. All Europe looks on our air mail service with reverence. There is nothing like it anywhere abroad. But, whereas we have mail routes, they have passenger lines. All Europe is covered with a network of lines carrying passengers between all the big cities. Now it is up to us to create and develop passenger lines that compare with our mail routes. For this we have natural advantages in the great distances here that lend themselves to rapid transportation by air. Moreover, we can make these long trips without the inconvenience of passing over international boundaries.

"What we need now, more than any one thing, is a series of airports in every city and town throughout the United States. Given these airports in a very few years the nations of Europe will be

looking towards our passenger lines as they now look to our mail routes."

The next day was Sunday — with the President and Mrs. Coolidge, he and his mother went to Church. After that he went to Arlington and placed a wreath on the tomb of the Unknown Soldier, visited the wounded war veterans at the Walter Reed Hospital, and attended a celebration in honor of the 150th Anniversary of the American Flag, and there was presented with the Cross of Honor. The next morning at breakfast he received from the National Geographical Society their Hubbard Medal, the greatest honor reserved to explorers, and which in its history has been awarded to less than half a dozen men.

But, New York's millions were already gathering on its streets. Lindbergh, who planned to make the flight in *The Spirit of St. Louis,* found that the salt air had seeped through the crate in which it had been packed, and the engine was not in condition to make the flight. So an Army pursuit plane was given him, and with the escort of 25 army planes from Detroit, he made the "hop" to New York in two and a half hours.

CHAPTER SEVEN

NEW YORK AND ST. LOUIS

PARIS, Brussels, London, Washington and now New York. This was the climax of all the enthusiasm Lindbergh had aroused. Landing at Mitchel Field he transferred to an amphibian plane and landed at the Narrows where the Mayor's Committee on the *Macon* was waiting to receive him. The harbor gleamed with craft of all descriptions, setting up such a babel of sound that conversation of any kind was impossible. Police launches darted here and there, trim yachts, tugs, large Hudson River boats were crowded to the gunwales with people eager to catch a glimpse of the slim young hero, hair waving in the breeze, who stood by the Pilot House of the *Macon*. As the Committee's boat headed for the Battery the fire boats in the harbor took up their salute, pumping streams of water into the air, to break into multi-colored wisps of shimmering, drifting mist. Overhead the air fairly buzzed with aircraft of all descriptions.

Such a sight had never before been seen in old New York. Thirty thousand people jammed Bat-

tery Park. The narrow canyon, formed by the immense buildings on lower Broadway, was packed with humanity, — the sidewalks were crowded from curb to building, tier on tier of people leaned out of the windows — side streets with people craning their necks for a view, spread for half a block along the route.

The moment the parade started New York's famous paper storm began. Newspapers torn into tiny strips, ticker tape, glinted in the sun like a hurricane of snow. One deep throated yell arose as Lindbergh came in sight, perched on the back of the automobile, his feet on the seat, a slim gracious figure looking interestedly at the dense mass of the people that surged against the policemen, but held.

At the City Hall, Mayor Walker in presenting Colonel Lindbergh with the scroll of welcome to the city, said "Colonel Lindbergh New York City is yours — I didn't give it to you, you won it." The Medal of Valor of the City of New York was pinned on his coat lapel. Lindbergh who was touched by the extent of the demonstration, in response to the Mayor, said, "When I was preparing to leave New York, I was warned that if we landed at Le Bourget we might receive a rather demonstrative reception. After having an hour at Le Bourget, I did not believe that anyone in New

York had the slightest conception of what we did receive. Again, at Brussels and at London. At London sixteen hundred of the pride of Scotland Yard were lost in the crowd at Croydon as though they had been dropped in the middle of the ocean. With the exception of a few around the car and around the plane, I never saw more than two at any one time.

"At Washington I received a marvelous reception. But at New York I believe that all four put together would be in about just the position of those London Bobbies."

From there the procession and its escort of units of the National Guard and their bands, went up Broadway to Fifth Avenue. Every yard along the four or five miles of its route, every window, bore its shouting mass of people, yelling its welcome to "Lindy." At the Eternal Light, Monument to New York's fallen soldiers, Lindbergh placed a wreath. At St. Patrick's Cathedral he got off to meet Cardinal Hayes. At Central Park, the end of the route, Governor Alfred E. Smith, waited to welcome the flyer on behalf of the State and to bestow on him its Medal of Valor.

This was only the beginning of New York's welcome to Lindy. The next day, the City of New York gave Lindbergh his biggest dinner. Four thousand guests were present. The jam outside the

Hotel Commodore was so terrific that it was only with the greatest difficulty that some of the guests found their way into the hall. It was a distinguished gathering of the city's great men. Mayor Walker was toastmaster—Governor Smith, Dr. John H. Finley of the New York Times, and the Honorable Charles Evans Hughes were the speakers.

Dr. Finley was on the program representing the youth of America. His "Saga of Charles Lindbergh" which enriches this narrative, is an indication of the lofty tribute he paid the returned hero.

"We have in this tall, slim stripling the living symbol of the new age—a youth who has.

pushed the sea and land
Farther away on either hand.

and who in his flight has even

split the sky in two
And seen the face of God shine through.

"Shakespeare speaks of his young Prince Hal as witching the world with noble horsemanship. But it is something more than your noble horsemanship among the clouds that has witched our greater world. It is the modest nobility with which you have borne yourself in all this acclaim in many tongues an acclaim which but tells the desire that

the world has in its heart for its youth. We are prouder than ever of America in being proud of you. And we think the better of ourselves because we care so much for you. *May our youth live up to this winged ideal, and may you be ever true to the boy that is in you.*"

Mr. Hughes made a memorable speech, "We measure heroes as we do ships by their displacement. Colonel Lindbergh has displaced everything. His displacement is beyond all calculation. He fills our thoughts; he has displaced politics, Governor Smith.

"For the time being, he has lifted us into the freer and upper air that is his home. He has displaced everything that is petty; that is sordid; that is vulgar. What is money in the presence of Charles A. Lindbergh?

"What is the pleasure of the idler in the presence of this supreme victor of intelligence and industry? He has driven the sensation mongers out of the temples of our thought. He has kindled anew the fires of the eight ancient altars of that temple. Where are the stories of crime, of divorce, of the triangles that are never equilateral? For the moment we have forgotten. This is the happiest day, the happiest day of all days for America, and as one mind she is now intent upon the noblest and the best. America is picturing to herself youth

with the highest aims, with courage unsurpassed; science victorious. Last and not least, motherhood, with her loveliest crown.

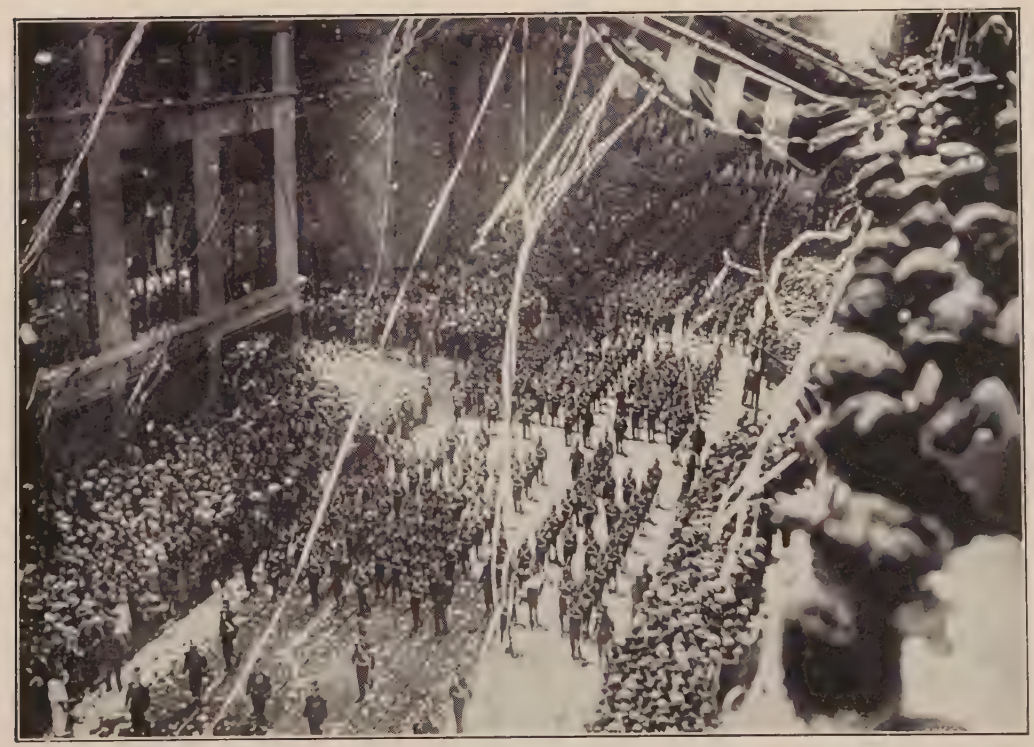
"We may have brought peoples together. This flight may have been the messenger of good will, upon the character of those who cherish it.

"We are all better men and women because of this exhibition in this delight of our young friend. Our boys and girls have before them a stirring, inspiring vision of real manhood. What a wonderful thing it is to live in a time when science and character join hands to lift up humanity with a vision of its own dignity.

"There is again revealed to us, with a startling suddenness, the inexhaustible resources of our national wealth. From an unspoiled home, with traditions of industry, of frugality and honor, steps swiftly into our gaze this young man, showing us the unmeasured treasures in our minds of American character.

"America is fortunate in her heroes; her soul feeds upon their deeds; her imagination revels in their achievements. There are those who would rob them of something of their lustre, but no one can debunk Lindbergh, for there is no bunk about him. He represents to us, fellow Americans, all that we wish—a young American at his best."

Luncheons, entertainments, special theatre pro-



International News Reel

The Lindbergh parade begins its march up Broadway when all New York turned out to welcome the returned hero.

International News Reel

What the harbor looked like when the Lone Eagle came back to New York.

grams were given for the hero, and even a simple record of them would fill a book. Clippings from the "New York Times" presented by that paper to Lindbergh did actually fill two large volumes. It was typical of Lindbergh that amidst all these honors, all the excitement, he was restless separated from *The Spirit of St. Louis.* Early the second morning he had gone off quietly to Curtiss Field and asked for an airplane to take him to Washington. The Major in charge looked up the weather report for Bolling Field. It was "poor and dangerous." He wouldn't take the responsibility of letting Lindbergh make the trip in that weather. The next night, however, at 3:00 a. m. Lindbergh was in the air winging his way to Washington. Four and a half hours later he was back at Curtiss Field with his beloved plane.

But St. Louis — home to Charles A. Lindbergh —was calling him. At about 8:00 a. m. on the morning of June 17th "We" took the air. At Dayton his escort of Army planes joined him. At five p. m. that evening the thousands watching for him saw the silver hope of St. Louis come into view and settle gently at Lambert Field—one month and five days after he had set out on his great quest.

Did St. Louis realize the incredible history that had been written in those short thirty-eight days? What St. Louis lacked in numbers, she made up in spirit and enthusiasm. This was "Slim" come home, and no ancient conqueror, with captives chained to his chariot wheels, returned in such triumph as Lindbergh did to his home town. Crowds made holiday for him — they shouted "Slim" to the skies as the parade the next day wound its way through its streets. A luncheon and banquet followed — and the following day an exhibition flight by *The Spirit of St. Louis* over the World's Fair Grounds. Everywhere the home town gave itself to "Slim."

PART III

PREPARATIONS FOR THE FLIGHT

"About my trip, there wasn't any of that casual unpreparedness, which some people seem to think there was, and I had everything of the best and every care was taken in the preparation of the trip.

"If I have been lucky, it was because I got fitted out with a perfect ship, equipped by men who took every care and precaution. Nothing was overlooked, and from the first we never had any trouble or setback. I had the pick of everything in the way of equipment."

LINDBERGH in the New York Times.

CHAPTER EIGHT

WE

FAME is a tower. We have just been looking across the huge pile of buildings that make the skyline of New York. It rises up, a solid hedge of stone and mortar, all shapes and sizes across the length and breadth of the island. Here and there from out of that mass there breaks out groups of taller buildings, and from them one or two that thrust out, towers that taper out finely, until they stand unobstructed against the sky, lone sentinel points of the city beneath them, landmarks to guide the eye.

But a tower cannot stand by itself. Beneath, growing broader every hundred feet or so, are the buildings with foundations reaching deep into the earth, for without them the towers would collapse.

The great flight that Lindbergh made had thrust him in a moment into dazzling prominence. His character — the spirit of chivalry in his enterprise had carried him, in the fame that followed, so far above anything similar that has ever occurred, that he stands out today without rival in the sky of public interest.

Underneath this tower of fame, however, is the training, skill and courage that made him the greatest flyer of his day, and the boyhood and the character foundations, without which he would have toppled from the dizzy heights to which he was carried, as a house of cards goes over when its building limit has been reached.

Lying immediately under the tower of Lindbergh's fame are the preparations he made for the flight. As we have suggested, and contrary to the popular idea, there was nothing hasty in the conception and execution of his plans. He first thought of undertaking the project in the Fall of 1926, while flying the mail between St. Louis and Chicago. Captain Fonck's attempt in the September previous had ended in disaster. Lindbergh, who knew every advance that had been made in airplane construction, could realize, as the layman could not, that such a flight was now well within the capacity of planes that could be built. The years of war construction had passed down to peace time effort the principles of a plane's lifting power. With it had come the art of making lighter planes, and most important of all, engines had been developed which were a marvelous advance on the war time engines in the power they gave for their weight.

The New York-Paris flight was a challenge to

aviation. We cannot emphasize that too much, or the fact that Lindbergh saw in a successful flight the possible development of an immense amount of interest in aviation, which would redound to the benefit of the cause to which he was devoted.

He was at this time Chief Pilot of the Robertson Aircraft Company of St. Louis, who had the contract for the air mail between that town and Chicago. We should remember that when we talk of Lindbergh as an unknown, that many men of twenty-four might be fully justified in considering that position and the salary it paid as qutie an accomplishment for so young a man. He had had up to this time a record of about 7,000 separate flights (that is an average of about four flights a day for his flying career at that time — five years), with about 1,500 hours in the air. He had carried nearly six thousand passengers, with never an accident to one of them.

Lindbergh came to the task with a great record of flying experience. The history of the air has been written by young men such as Charles Lindbergh. Indeed, flying has been the enterprise of young men. It is probable that Major William B. Robertson, the head of the company that bears his name and for which Lindbergh was Chief Pilot, saw in a moment the fine possibilities when Lindbergh spoke of his idea of a trans-atlantic flight and we

know he fell in with Lindbergh's plans immediately. About fifteen thousand dollars were necessary for the undertaking. A small group of public spirited citizens of St. Louis undertook the financing, Lindbergh himself putting in all his savings — $2,000 — the largest individual contribution to the fund.

Before the end of the year (1926) Lindbergh was East, studying types of planes, engines and instruments that would be best suited for the tremendous undertaking he planned. When at the end of February, 1927, he placed the order for the Ryan monoplane, that afterwards became *The Spirit of St. Louis,* he knew exactly what he wanted, and how he wanted it, the motive power of his plane, and the instruments that he would need for the hazardous enterprise.

There were one or two things in the mature plans of this Ace of Aces that illustrate the simple directness with which Lindbergh thought through his problem. First of all is his decision on a light plane with a single engine. Not a single one of the many who had thought of such a flight, had thought of it in terms of a single-engined plane. Three, or at least two, it was felt, would be an absolute necessity — the minimum of safety for such an enterprise. Three engines, argued Lindbergh, would only increase the chance of engine

failure by that much. It was doubtful that a multi-motored plane, with the heavy load required for such a flight, could keep the air in the early stages, if one engine failed — and indeed this was borne out tragically in the case of Commander Noel Davis, who found he had to make the fatal landing when his three engines refused to hold his plane in the air with its full load. Commander Byrd had some moments of grave doubt of the ability of his plane to keep the air in the early stages of his flight.

A single engine, with its minimum of resistance, would also give him a greater air speed, argued Lindbergh, and consequently a greater range. He had thought through it with precision, and how justified he was in it is evidenced in the fact that the large majority of long distance flights undertaken since then have been with single motored planes. In this he had run counter to expert opinion.

One of the chief lay criticisms before the flight was Lindbergh's decision to fly without a navigator. How he was justified in the accomplishment, there is no need to point out.

"I hit the Irish coast," he said writing for the New York Times the day after his flight, "only three miles from the theoretic point that I might have hit if I had had a navigator. I replaced a navigator's weight by the inductor compass. This com-

pass behaved so admirably that I was ashamed to hear any one talk about my luck."

But it gives us an important understanding of the man to follow his line of reasoning. The problem of navigation roughly divided itself into two separate parts. From New York to Cape Race there were a number of landmarks by which the course could be checked. Lindbergh with his great record of cross country flying was as competent as anyone for that task. During the ocean hop of 1,850 miles the course could not be checked except by celestial navigation or radio bearings from two ships, as Commander Byrd did when, during nearly nineteen hours of flying in fog, the sextant was useless. Lindbergh could take advantage of neither of these aids, but once arrived on the coast of Europe the country could be identified by the terrain, and the compass course to Paris thereafter frequently checked.

For that hop of 1,850 miles during which there would be no checking at all, Lindbergh felt that the choice would be between trusting fully to his Earth Inductor Compass (he carried a magnetic compass to which he could have referred easily if the other went wrong) and carrying a man, representing a dead weight of about 200 pounds — that is, unlike gasoline or oil which lightens the plane as it is used up the man's weight remains

constant. If at the end of the water hop, he found himself three hundred miles from his course, he could still, wtih the extra cruising range the omission of a navigator gave him, find his way to Paris.

In point of fact, following the compass course he worked out, he arrived at the end of the Atlantic hop only three miles out of his course. Two weeks later Chamberlin in the *Columbia* flew across the Atlantic without a navigator and with his Earth Inductor Compass out of order from the start.

For the swift jump that Lindbergh intended, he was again thinking with the utmost precision. Of his tendency to travel alone we write elsewhere. That is a trait that had come up with him from boyhood.

The Ryan Airlines fell into the spirit of the Lindbergh enterprise immediately. The president of this concern, Mr. B. F. Mahoney is only 26 years of age, and the whole undertaking became the job of young men. Taking their stock Model MI as a basis, within sixty days engineering, drafting and manufacture to the final touch was completed, and Lindbergh himself ran the tests. No one else has ever flown the ship.

The stock model of the Ryan plane, used for carrying mail, is the same semi-cantilever type monoplane. The pilot has a cockpit just behind the wings, the cabin for mail or passenger is under the

wings. The oil tank and the large gas tanks took the place of the mail compartment. In the wings were additional gas tanks, behind them the pilot's cabin, completely enclosed. Windows on either side gave the pilot a side view, a forward view could only be obtained through a periscope. To give the plane added lifting power the wing area was increased. A Wright Whirlwind J5 developing 223 horsepower, furnished the motive power. The instrument board contained the very latest instruments that had been made in the development of aerial navigation.

One or two of the features of his plane must strike even the lay observer with the foresight with which it was planned to meet the peculiar necessities of the transatlantic flight, and the safety factors involved — rather strange considerations for the man the public called "The Flying Fool."

First, placing the gas tanks ahead of the pilot. In a crash a pilot caught between engine and tank in a heavily loaded plane would not have one chance in a thousand to save himself from being crushed. This Lindbergh avoided by having the gas tanks in front of him. Second, quite a number of the failures in long distance flights have been due to the feed pipes choking for they are comparatively easily bent or otherwise damaged. In Lindbergh's plane the tanks fed almost direct into

the engine. No feed pipe line on *The Spirit of St. Louis* was two feet long.

And while we are on the subject, here are some of the other factors of safety which had been devised and which Lindbergh carried in case of a forced landing at sea.

Special petcocks whereby the tanks could be emptied in a few minutes. The air in the tanks would then act as a buoy to float the plane.

A collapsible life raft and oars.

Concentrated Army emergency rations for two weeks.

Flares in a bicycle inner tube to keep them from becoming damp.

Sharp knife, needle and twine so that in case of a forced landing at sea he could cut a piece of canvas and make a kite as a signal of distress.

An Armburst cup, which distills human breath into water.

Four quarts of water.

Other essential equipment.

During the two months in which The Spirit of St. Louis was being built, Lindbergh was studying the navigation problem he would have to face over the Atlantic. By the aid of maps showing the magnetic fields that flow in uneven streams from the magnetic pole, he worked out his course every inch of the way, every setting on the dial of

the Earth Inductor Compass (the compass is based on these magnetic lines) that he would be required to make. In view of the stories circulated about his only having a school geography map to navigate, it is interesting to note that he carried not only two hydrographic charts of the North Atlantic with his course marked but maps of the States and provinces of Canada, through which he would pass to Nova Scotia, maps of Ireland, England, and France, and a map of Europe!

When Lindbergh came to try out the ship, in every respect he found it not only came up to the theoretical, but exceeded it. He made careful tests of its speed, gas consumption, weight lifting capacity.

He had flown many ships—ancient Jennies, fast Army planes, planes that he put through their tests for reliability and never saw again. But here was a plane that had been built to his order, that embodied his ideas in its design, that he had seen grow up from the drafting board of Chief Engineer Hall (who had once worked thirty-six hours at a stretch) into a finished and perfect machine.

Those who know him say that he loved the planes he flew. The plane, not yet christened *The Spirit of St. Louis,* was a thing of beauty. The white paint and dope gave her an appearance of silver in the sky. The heavy tanks required that she have a nice

balance. The fuselage of duralumin gave her a remarkable sturdiness. The enclosed cabin gave her a perfect stream line. She was equipped with what Lindbergh considered motive power of the very highest reliability. Her instrument board had the finest and best equipment. *The Spirit of St. Louis* was an aviator's dream come true. No wonder he thought of it with such affection; no wonder he spoke of it as an equal partner with him in the great enterprise!

The account of how Lindbergh prepared for the great task that brought him fame would not be complete without mention of the fact that he made tests to prove that the human machine would be capable of the supreme feat of endurance to which he would subject it. He had as a natural endowment, a superb constitution, hardened by years of outdoor life and flying. Sleep was his greatest danger, and experts said it would be impossible for him to remain awake under the strain. By actual tests he proved to his satisfaction that he could remain awake for the time required.

His superb confidence was based in every respect, and to the fullest extent possible, on careful preparation.

Not for nothing does Lindbergh say in his message to Scouts: "Your motto 'BE PREPARED' is the greatest factor of success in life."

THE LONE SCOUT OF THE SKY

CHARACTERISTICS OF THE SPIRIT OF ST. LOUIS

Ryan Model NYP

General

Span ..... 46 ft.
Chord ..... 7 ft.
Wing area ..... 319 sq. ft.
Aerofoil ..... Clark Y
Engine: Wright J-5, giving 223 h. p. at 1,800 r. p. m.
Propeller: Standard Steel Propeller Co.
Dural. set at 16¼ pitch.

The body of the plane was of duralumin, the wings of wood and fabric.

Weights	*Pounds*
Empty complete with instruments	2,150
Useful load—	
Pilot	170
Miscellaneous	40
Gasoline—425 gal. (Western at 6.12 per gal.)	2,600
Oil—25 gal. at 7 lbs. per gal.	175
Gross weight fully loaded at start of flight	5,130
Gross weight lightly loaded at end of flight without gasoline and food but with 10 gallons of oil left	2,415

Loading

Wing loading:
Full load at start of flight—16.1 lbs. per sq. ft.
Light load at end of flight—7.57 lbs. per sq. ft.
Power loading:
Full load start of flight—23.0 lbs. per b. h. p.
Light load at end of flight—10.8 lbs. per b. h. p.

Calculated Performance (r. p. m. data based on tests and theory)

Maximum speed:

Full load—120 m. p. h.

Light load—124.5 m. p. h.

Minimum speed:

Full load—71 m. p. h.

Light load—49 m. p. h.

Economic speed:

Full load—97 m. p. h. at 1,870 r. p. m.

Light load—67 m. p. h. at 1,080 r. p. m.

Fuel economy at economic speeds:

Full load with full rich mixture—6.59 miles per gal.

Light load with lean mixture—13.9 miles per gal.

Range:

At ideal speeds of 97 start and 67 m. p. h. at end—4,110 miles.

At practical speeds of 95 start and 67 m. p. h. at end—4,040 miles.

Flight test performances

Maximum speed:

With 25 gal. gas and 5 gal. oil—129 m. p. h. over 3 k. m. course.

With full load of 425 gal. gas and 25 gal. oil—124 m. p. h. approximate, based on calculated performance.

With 25 gal. gas and 4 gal. oil by air speed meter—128 m. p. h.

With 20 gal. gas and 4 gal. oil by air speed meter—127 m. p. h.

Take off distances:

Tests made at Camp Kearney near San Diego, Cal., at 600 ft. altitude. Oil—4 gallons.

Gal. Gas	Gross Wgt. Pounds	Approximate Head wind vel. m. p. h.	Take off distance feet
36	2,800	7	229
71	2,800	9	297
111	3,050	9	389
151	3,300	6	483
201	3,600	4	615
251	3,900	2	800
301	4,200	0	1,023

All actual flight tests were conducted by Lindbergh himself. No one else has flown The Spirit of St. Louis.

CHAPTER NINE

ENGINE AND INSTRUMENTS

> "I had what I regard as the best engine, and I was equipped with what were in the circumstances the best possible instruments for making such an effort. I hope I made good use of what I had."
>
> LINDBERGH in the New York Times.

THE engine and instruments of *The Spirit of St. Louis* are practically identical with those used by Clarence Chamberlin and Commander Byrd in their flights, the only difference being that the *America* was equipped with three engines, while each of the others had but one. They represented the great development that America has made both in engine and instruments of air navigation, and which compare with the best produced anywhere in the world.

The Wright Whirlwind engine, which also provided the motive power for Commander Byrd's North Pole Flight and the Army flight to Hawaii, proving the ability of the engine to function in heat as well as it does in extreme cold, has nine cylinders

arranged in a circle around a central crank-shaft. The cylinders are air-cooled. It develops 223 H. P. at 1800 revolutions per minute. Its total weight is 508 pounds.

Lindbergh chose the Wright Whirlwind engine for his plane on the reliability it had already demonstrated. It is entirely a post war development undertaken under the direction of Mr. Charles L. Lawrence, encouraged by the U. S. Army and Navy. Up to the end of the war there had been no air-cooled American engine developing more than 100 H. P.

There are two obvious advantages in an air-cooled engine for airplanes. The first—the saving in weight. It also removes what has been frequently a cause of failure in important flights. It will be recalled that the first transatlantic non-stop flight undertaken by the Australian aviator Hawker came to grief because of the failure of the water cooling system.

The nine cylinders are equally spaced in a circle around a single-throw revolving central crank-shaft. Two magnetos, mounted on the front crank-case section, fire the two plugs set on opposite sides of each cylinder head. The cylinders have a four and one-half inch bore with a five and one-half inch stroke. Oil is pumped at high pressure into the cylinders and the bearings, and a constant pres-

sure of gasoline is maintained at the carburetor. A great many of the parts used in this engine are standard designs of well-known manufacturers of automobile engine equipment.

Of the instruments on Lindbergh's plane—all of them manufactured by the Pioneer Instrument Company of Brooklyn—the Earth Inductor Compass has aroused the greatest interest. It is a comparatively new invention. As we have stated it is based on the relation of the magnetic fields that flow out of the magnetic pole in varying streams over the earth's surface to the magnetic field developed through electricity on the plane.

The Earth Inductor Compass is in three parts on the plane. At the tail of the plane, as far removed from the engine's vibration as possible, is a generator. Before the pilot is the Controller with a pointer, by which he sets any course desired, and an Indicator. When the needle on the last instrument points to zero the pilot knows he is keeping the course he has set. When the course on the Controller has been set, the pilot by turning his machine left or right as may be necessary, brings the needle to zero for the new course.

The chief value of the Earth Inductor Compass is that it provides the absolute accuracy which it was not possible to obtain from the magnetic compass. It has a more positive action, that is the

needle comes back faster, the position of the generator in the tail of the plane lessens the chance of it being affected by iron in the plane itself, and it is adjusted to counteract the roll and pitch, or the position in which the plane is flying. With the Earth Inductor Compass, when it is necessary, as it was in Lindbergh's case, to fly off his course while dodging bad weather, a correction would be made by the simple expedient of flying an equal time with the needle as far right of zero as he had been flying left, or vice versa.

Mr. M. W. Childs writing in the St. Louis Post-Dispatch describes the working of the Earth Inductor Compass, which we have taken the liberty of altering slightly, as follows:

"On the instrument board of *The Spirit of St. Louis* is a black dial, marked out in white by mathematical computation with the degrees of the compass between north, south, west and east. Now, Lindbergh planned to begin his journey on magnetic highway A, which we will suppose, runs 13 degrees north of northeast. Before he ever taxied off Roosevelt Field he set this dial, by turning a handle on its face, to this degree: 13 degrees north of northeast—highway A—on the lone route that was to carry him to Paris.

"This handle on the dial in turn leads back—by a series of connecting rods and joints—to an elec-

tric generator located in the tail of the airplane.

"Electricity is generated, as every student of high school physics knows, in a variety of ways. One way is to rotate coils of wire, wrapped about an iron core between the poles of a magnet, at a high rate of speed. The coils of wire, revolving rapidly, cut the intangible magnetic lines that run between the poles of the magnet—technically called the magnetic field—and electricity is produced.

"Now the generator—the term given to such a machine for producing electricity—in the tail of *The Spirit of St. Louis,* differs from the ordinary generator in this respect. Instead of cutting the magnetic lines running between the poles of the magnet, the coils of wire in this generator cut the magnetic lines of the earth—the lines of those same magnetic highways by which Lindbergh steered his way to Paris. Imagine for example, that there are steel rods—representing magnetic lines—in an imaginary concrete highway. It must be remembered that the coils of wire in the generator will not produce any electricity unless—in revolving—they cut magnetic lines.

"Lindbergh stepped into the cockpit with the dial set for magnetic highway A. The coils in the generator, too, were set for highway A by means of the rods connecting them with the dial handle. *The Spirit of St. Louis* taxied over the muddy field,

slowly lifted into the air, gathered speed and roared away into the distance. And with the gathering speed the coils of the generator turned faster and faster, impelled by the little windmill on the outside.

"Along with the dial indicating the degrees of the compass on the instrument board is an Indicator—it really is a voltmeter, used to measure the flow of electricity—wired to the generator in the tail of the plane. This Indicator resembles the ammeter on a motor car, the device by which it is known whether or not the battery of the car is being charged. Like the ammeter, it has a needle, which when no electricity is being generated, is perpendicular, indicating zero. To either side of zero degrees are indicated by white lines—to left and right, that is.

"It was Lindbergh's first job as navigator to locate highway A. He would know when he struck this particular highway by the fact that the needle of the indicator on his instrument board would be at zero—at zero because no electricity would be generated, since the coils of the generator had been set for highway A."

It should be remembered that this is an *aid* to air navigation, and by no means a fool proof device. With the best aid it can give, Lindbergh's feat in navigation reflects remarkable skill and judgment.

The Spirit of St. Louis also carried an Air Speed

Indicator, Rate of Climb Indicator, Turn and Bank Indicator, Altimeter, Tachometer, Speed and Drift Indicator with a stop watch, besides a clock, a magnetic compass and other instruments.

Each of these played its part in the success of the enterprise, and each of them represents the contribution of science to the problems of aerial navigation.

During the course of his flight, especially between Newfoundland and Ireland, and his battle with fog and sleet, practically every one of these instruments became of prime importance. On that occasion when riding into the fog Lindbergh found sleet collecting on the wings of *The Spirit of St. Louis,* and opening the throttle wide he sent her darting up to ten thousand feet, two of his instruments came immediately into action, instruments to which he, with good visibility had not paid very great attention. These were the Altimeter and the Rate of Climb Indicator.

The former is a device to tell the height at which a plane is flying. The principle on which it works is that of an aneroid barometer. If you take a metal box, with a thin corrugated metal top, remove most of the air from it and seal it, the air-pressure at different levels would cause the flexible top to move in and out. A needle connected with such an arrangement notes for the benefit of the pilot the changes in air pressure, transferring them

International News Reel

Eager Belgians look over THE SPIRIT OF ST. LOUIS

International News Reel

The U. S. S. Memphis bringing its famous super-cargo into Washington's Navy Docks.

on his dial into terms of feet above sea level. The higher up an airplane is, the less becomes the pulling power of the propeller.

When Lindbergh found it necessary to turn the nose of *The Spirit of St. Louis* upward in a hurry that time, he could easily, had he not been careful, pointed it at a too steep angle and stalled. The Rate of Climb Indicator is a device to help the pilot climb at the highest possible rate. It works on somewhat the same principle as the Altimeter, but its reactions are instantaneous, the rate being indicated through the air forced in or out of a tube. They have the same relation to each other that the speed and total mileage indicators on an automobile have to each other.

Among Lindbergh's instruments were two devices by which he could judge his speed, and that is of importance, for, as you will remember, he was required to change his compass course every 100 miles. The Air Speed Indicator is a device to measure the speed of the plane as it goes through the air. This, of course, is not the same as ground speed, for the wind may either aid or retard the actual progress made over land or water. The tachometer measures the revolutions of the propeller. Lindbergh also had a device for judging the speed and direction of his drift, which required some object as land or a white cap, on which it could be sighted. A side wind could have blown

Lindbergh hundreds of miles off his course if he had not watched for it, and made the necessary adjustments to keep him on the course he had planned.

The Turn and Bank Indicator enabled Lindbergh to tell when the ship was staying on an even keel. It is worked on the same principle as the spirit level, but the luminous ball in the Turn and Bank Indicator moves in the opposite direction. That is when the plane is tilted left, the ball moves in that direction, whereas in the spirit level the bubble would move to the right.

This instrument has been invaluable in each of the transatlantic flights, for when flying blind it is of paramount necessity. When Alcock and Brown flew the Atlantic in 1919 they did not have this instrument, and every time they lost horizon, pilots and plane were in dire peril. Once they came out of the fog a few feet from the water, flying upside down; on another occasion at right angles to the sea, with one wing nearly touching water. Lindbergh encountered no such difficulties, thanks to these instruments. For two hours at a stretch, and several times for shorter periods, he was forced to fly blind. Such a feat as the *America* performed of flying nearly nineteen hours in the fog without sight of land, water or sky, would hardly have been possible without these devices.

PART IV

THE TRAINING OF A TRANSATLANTIC FLYER

"I entered the other day, the time of my flight in my log book and I find that in the five years I have been flying I have made 7,190 flights, totaling 1,823 hours, 40 minutes on a conservative estimate. That thirty-three hours single flight was only a small part of the total. Last year I flew 763 hours. In all, I have carried 5,951 passengers, and I am glad to say I have never had an accident either to any one of them or to myself.

"I wasn't, in that way, entirely unprepared for the flight I had made."

LINDBERGH in the New York Times.

CHAPTER TEN

TRYING HIS WINGS

As we have suggested, the record of a few men can compare with Lindbergh's experiences in its peculiar fitness and training for the great flight which has made his name famous. If one had set about finding a method of training that would build up a man to undertake this feat there could hardly have been a better choice than the method by which Lindbergh prepared himself, or the natural endowment with which he came to flying.

After nearly two years at the University of Wisconsin, he gave up college to take up flying, and if he found it suitable, to make it his life work. This was in March 1922. He had carefully studied the tuition available to a student flyer and had decided on the course given by the Nebraska Aircraft Corporation at Lincoln, Nebraska. The tuition fee was $500. He started the journey from Madison to Lincoln on his motorcycle, but the roads were impassable and cycle and rider completed the journey by rail.

Lindbergh had been brought up to make his own decisions, and he went at them even then with a

simple directness. Heretofore, he had never been near enough to an airplane to touch it. He had a hankering for flying. He would find out, not only if he was suitable for that occupation, but if it would give him that large zest for the thing that would justify him in devoting a lifetime to it.

The story of Lindbergh's flying experiences, and especially the early part of it, is peculiarly his own story, for in the next two years, his flying under varying circumstances was mostly alone, and he alone is capable of a consecutive narrative. This he has done admirably in his own story "We" published by G. P. Putnam's Sons, an authentic document, with many humorous touches and incidents, which anyone interested in the real Lindbergh will find necessary to a correct understanding of the man whose name has become synonymous with aviation, who could so closely identify himself with the air and the machine that bears him in that element and speak of them as an integral part of himself.

For our purposes here a rapid sketch of his training in the air alone is necessary. Lindbergh took to the new element easily. He had already a good knowledge of engines, and there being no regular ground work, he picked up what he could around the factory. In addition, in the two months, he received about eight hours instruction in the

air and was declared by the instructor as ready for his solo test. A bond of $500 was required by the company for possible damage, and as Lindbergh felt he could not put this up, this part of his instructions was never completed. About this time the training plane was sold, and Lindbergh persuaded the new owner to take him as mechanic and helper, and had his first experience of barnstorming, and, incidentally, of cross-country flying. Barnstorming in aviation is taking your plane to the smaller towns, and giving anybody who will go up a ride of five to ten minutes for five dollars. Here he did a little "wing-walking" to attract the crowds. Returning to Lincoln a month later for the balance of instruction in the school, he found Charlie Harden, well known parachute expert, in Lincoln. Lindbergh was fascinated with the idea of parachute jumping and persuaded the head of the school to let him make a double parachute jump with Harden's chutes from one of the school planes. He later worked for a few weeks in the Lincoln Standard factory, but when he had an offer to become a parachute jumper for a barnstorming plane, he swopped the balance of his tuition for a new Harden chute. In the months that followed, Nebraska, Wyoming and Montana saw him parachute jumping, until with the beginning of the cold weather the "season" had closed.

It was typical of Lindbergh the Lone Scout—he was not yet the Lone Eagle—that from Montana where his flying season had terminated that he should want to make the journey back in a boat. The route he picked out was down the Yellowstone River. He purchased a boat for two dollars, worked a few days patching it up, and started on the tremendous journey. The river at this point runs shallow and rapid and the flat bottom of the boat kept scraping against the rocks and tearing open. Bailing the boat came to be, after a few hours, half the duties of the lone adventurer. Camping equipment had to be carried lashed to the seat, but by the end of the first day twenty miles had been made despite the rain that had been falling almost steadily during the day. On the wet ground he made camp that night, pitched his pup tent and ate a cold supper. The rain next morning, with the further damage by the rocks to the boat, made bailing the principal occupation, and at the end of the day an examination of the boat showed that further navigation in it was impossible. So the boat was swapped for a buggy ride to the nearest railroad station.

Since beginning to fly, and finding himself liking and suited to the demands of flying, he had decided to purchase his own plane. So next spring he went

to Americus, Ga., where the Army was selling its surplus stock of war training planes. For five hundred dollars he bought a new Curtis Jenny, with an OX-5 motor and full equipment.

Here was his plane, ready and assembled, but Lindbergh had never yet flown solo, and he had not been in an airplane for six months. He started to "learn by doing," taxied to the end of the field and opened her up. "When the plane was about four feet off the ground, the right wing began to drop, so I decided that it was time to make a landing" he writes. "I accomplished this on one wheel and one wing skid but without doing any damage to the ship. I noticed that the wind was blowing hard and suddenly decided that I would wait for calmer weather before making any more flights and taxied back to the hangar."

A pilot at the field gave him a little instruction, and after a few take-offs and landings, he strapped his camping equipment and personal belongings in front of the cockpit and set off for Minnesota.

That was the beginning of adventures that lasted nearly two years barnstorming across the length and breadth of the country. All the time of course, he was gaining in skill as a pilot and cross-country flyer. Frequent stops were made on that journey to Little Falls, and Lindbergh stayed at each place

COL. CHAS. A LINDBERGH'S DECORATIONS & TROPHIES 1927.
1. Belgium-Order of Leopold
2. British Distinguished Flying Cross
3. R. Orteig (donor) prize medal
4. Hospitalier Sauveteur (Fr. Red Cross
5. Special gold medal-Albert of Belgians
6. Gold Medal-Mayor's Reception, N. Y. City
7. From New York State for Valor

Courtesy Missouri Historical Society

Col. Chas. A. Lindbergh's Decorations and Trophies, 1927.

Acme News

Lindy addressing his first audience in America at Washington's official welcome.

as long as people wished or could be induced to ride five or ten minutes in his plane for five dollars. In this way he more than broke even with his expenses. His father was running for United States Senator that year and was in the midst of his campaign when Lindbergh got home. During the campaign he became official pilot to his father carrying him around from place to place. Later he went back to barnstorming, flying his Jenny through southern Minnesota, Wisconsin, Illinois to St. Louis to take part in the International Air Races. Here he sold his plane with instructions, and after the plane was delivered and some other minor flying adventures, in a Canadian Jenny, which belonged to a friend of his he made a journey by easy stages, with just enough barnstorming to pay the expenses of the trip, across the continent to Florida, and from Florida across the continent towards California.

The recital of those adventures, brief and direct as Lindbergh makes it, fills a book. Nearly two years is covered in this period, and it was in its way, invaluable training. First of all in resourcefulness, for the planes and the conditions in which these barnstorming trips were made developed all kinds of emergencies—emergencies in repairs, emergencies in landing, emergencies in flying. With it also began to develop a sure feel for the

air, and a precision in finding his way from place to place. He had learned to fly at night, to follow the needle of a compass with accuracy. Flying machines of meagre power, under circumstances that might try the best of pilots, Lindbergh did not have a single accident that resulted in injury to any one.

CHAPTER ELEVEN

IN THE ARMY

FLYING the ancient Jennies, Lindbergh had looked with longing at the fast Army and passenger planes. At the International Air Race at St. Louis he says he would have been willing to give all the profits of his month's barnstorming for the opportunity to take up one of these planes. On the advice of an Army flyer he had made application to be enlisted as a flying cadet at the Army Training School. Only the Army or Navy could provide such training as Lindbergh wanted. In January 1924 he had appeared before the examining board at Chanute Field, Rantone, Illinois. He had qualified and on March 15th, 1924, reported with 104 others at Brooks Field, San Antonio, Texas.

Brooks is the Army's preliminary training field. Here the student receives his first training in flying. If at the end of a reasonable period of instruction the student is not able to fly solo, take off and land his plane, his career as a cadet is at an end. If a student survives he goes on to maneuvres that become more and more complicated.

In addition to actual flying, there is the ground school, consisting of work in motor, ignition, carburetor, navigation and many other subjects.

Later there are cross country tests for navigation and landing on faster planes than the Jennies (with 150 H. P. Hispano-Surga motors) and still later simple formation flying.

At the end of six months preliminary training the class is passed on to Kelly Field for advanced instruction.

Lindbergh finished this preliminary instruction with an average of 93 in the twenty-three subjects he was required to study. Most of those in the ground school were new to him. The following is the rating he received in each one of the subjects in which he was examined:

Infantry drill, 95; army regulations, 99; military law, 99; army paper work, 85; military hygiene, 93; property accounting, 72; field service regulation, 99; guard, 99; military sketching and map reading, 94; motors, 94; aerodynamics, 99; rigging, 86; instruments, 90; code and signals, 95; aerial navigation, 88; meteorology, 99; photography, 93; Browning machine gun, 89; Lewis machine gun, 99; synchronizing gears, 99; aerial sights, 88; camera guns, 92; parachutes, 94.

Only a part of Lindbergh's class had survived Brooks Field, and those that remained went

through exactly the same process of weeding out, for now the requirements were such that only those with real "air sense" could meet them. After a few days getting accustomed to their planes they were required to fly figure eights around two marks given them, make landing on a white circle with their engine cut at a thousand feet, as well as hurdle landings—that is, landings just over a hurdle, as over a fence. There was also training for cross country flying, and training in air gunnery, firing both the Browning head on through the propellor, and the Lewis from the observer's seat. Towards the latter part of the course the students were required to fly every type of airplane used in the Army, fast scouts and large bombers, and constant instruction was given in formation flying for combat purposes.

It was during one of these close formation maneuvers that Lindbergh had his first experience of an emergency parachute jump. The report he turned in on the incident was as follows:

"A nine-ship SE-5 formation, commanded by Lt. Blackburn, was attacking a DH4B, flown by Lt. Maughan at about a 5,000 foot altitude and several hundred feet above the clouds. I was flying on the left of the top unit, Lt. McAllister on my right, and Cadet Love leading. When we nosed down on the DH, I attacked from the left and Lt.

McAllister from the right. After Cadet Love pulled up, I continued to dive on the DH for a short time before pulling up to the left. I saw no other ship nearby. I passed above the DH and a moment later felt a slight jolt, followed by a crash. My head was thrown forward against the cowling and my plane seemed to turn around and hang nearly motionless for an instant. I closed the throttle and saw an SE-5 with Lt. McAllister in the cockpit, a few feet on my left. He was apparently unhurt and getting ready to jump.

"Our ships were locked together with the fuselages approximately parallel. My right wing was damaged and had folded back slightly, covering the forward right hand corner of the cockpit. Then the ships started to mill around and the wires began whistling. The right wing commenced vibrating and striking my head at the bottom of each oscillation. I removed the rubber band safety from the belt, unbuckled it, climbed out past the trailing edge of the damaged wing, and with my feet on the cowling on the right side of the cockpit, which was then in a nearly vertical position, I jumped backwards as far from the ship as possible. I had no difficulty in locating the pull-ring and experienced no sensation of falling. The wreckage was falling nearly straight down and for some time I fell in line with its path and only slightly to one

side. Fearing the wreckage might fall on me, I did not pull the rip cord until I dropped several hundred feet and into the clouds. During this time I had turned one half revolution and was falling flat and face downward. The parachute functioned perfectly; almost as soon as I pulled the rip cord the riser jerked on my shoulders. The leg straps tightened, my head went down, and the chute fully opened.

"I saw Lt. McAllister floating above me and the wrecked ships pass about one hundred yards to one side, continuing to spin to the right and leaving a trail of lighter fragments along their path. I watched them until, still locked together, they crashed in the mesquite about 2,000 feet below and burst into flames several seconds after impact.

"Next I turned my attention to locating a landing place. I was over mesquite and drifting in the general direction of a plowed field, which I reached by slipping the chute. Shortly before striking the ground, I drifted backwards, but was able to swing around in the harness just as I landed on the side of a ditch less than 100 feet from the edge of the mesquite. Although the impact of landing was too great for me to remain standing, I was not injured in any way. The parachute was still held open by the wind and did not collapse until I pulled in one group of shroud lines.

"During my descent I lost my goggles, a vest pocket camera which fitted tightly in my hip pocket and the rip cord of the parachute."

At the end of his army course the student has mastered all the tricks in repertoire of a stunt flier —loops, spins, barrel rolls, figure eights—for these are essential requirements in combat work, and in acquiring full control of a plane. The test pilot puts a plane through its paces in this way, for if there is any defect in construction, this will show it up immediately. It also gets the student used to every position in the air, so that in an emergency he will not be nonplussed by any possible condition.

Lindbergh's class during the course at Kelly Field had dwindled to thirty-three. That class, near the end of the course, were divided for specialized training in the four branches of aviation—pursuit, bombardment, attack and observation. Pursuit is the most popular branch, but it calls for exceptional flying ability and only the very finest pilots are chosen for its service. Lindbergh was one of the eight chosen for such training. At the end of the course (February 1925) he was one of the 18 to graduate and receive his commission out of a class of 104 who had come to Brooks Field.

To his flying record had been added 230 hours of flying in Army School, 155 of them in advanced training. He had graduated not only with a good

record in the air but in ground work—with its twenty-three subjects already enumerated.

To his inborn navigation sense had been added scientific training in navigation—instruments, maps, map reading, and other subjects equally vital to a first class airman. It was at Army school that he first saw the Earth Inductor Compass and had its principle explained to him.

CHAPTER TWELVE

FLYING THE MAIL

"All Europe looks at our air mail service with reverence. There is nothing like it abroad."

LINDBERGH.

Two years of barnstorming across the country had made Lindbergh a resourceful flier—the year at the Army training school had made him a finished aviator, capable of flying the swiftest machines that take the air. It was only necessary to explain the controls to him, and he could fly with equal ease the swift scout planes of France or England, as he did the new American pursuit planes. The year at Brooks and Kelly, with its ground training, had filled out what he had been learning during his barnstorming days largely by trial and error. He had fallen into all this with so much absorption, that he had little time to "impress" people. His instructors said of him "he never did anything out of the ordinary, but one could easily tell he was a born aviator."

He was now 23. After three years he was still fascinated by the air. The tall, shy, overgrown country lad was taking on the poise and bearing of

the man, absorbed not merely in the pleasure flying gave him, but in the commercial possibilities of aviation and its future. The old overalls, with its capacious pocket that had carried so much, were replaced by neat riding breeches and boots. Indeed, those who speak of him from now on are constantly impressed with the neatness of his attire despite the fact that he was tinkering all day long with the engines of planes or flying them.

On his return to St. Louis in the spring of 1925 he was offered and accepted the position of chief pilot to the Robertson Aircraft Company who had put in a bid for the Air Mail contract for the new route between St. Louis and Chicago, which the post office had decided on opening. While waiting for word on the award of the contract Lindbergh joined the Missouri National Guard, and did a considerable amount of barnstorming. In the Standard plane in which he was barnstorming Lindbergh attempted to get in the International Air Races held that year in New York, the fliers starting from California, but the old bus could not stand the strain, despite much coaxing, and he had finally to give up the idea. While at St. Louis he would frequently test planes for the Robertson Company. It was while doing the latter that he was forced to make his second emergency parachute jump. At 2,000 or 3,000 feet he put the plane into a tail

spin, but when he tried to right it the plane would not respond to the controls. He stuck with the machine in endeavoring to bring it under control until he was only 350 feet from the ground and then jumped. The jump was too short for entire safety, but the parachute responded immediately to his tug on the rip cord. He was jarred in the landing, but without serious injury. Indeed, he had pulled in the shroud lines and was folding up the parachute when the attendants reached him.

As soon as the Air Mail contract was awarded the Robertson Aircraft Company, Lindbergh found his hands full. Beginning in the fall (1925) he helped to get up a complete ground organization to take care of all the requirements of the service. Machines had to be tested and numerous other details attended to. Lindbergh fell into the work with enthusiasm, displaying considerable executive ability.

On April 15, 1926, he began his mail flying, taking the first ship out of Chicago on the new St. Louis route and the first out of St. Louis for Chicago. Day after day, he and his fellow pilots flew the schedule, frequently making other trips when necessary.

The first regular air mail service in the United States was opened on May 15, 1918, between New York and Washington, D. C. Army aviators and

planes were furnished for the experiment, and later that year, equipment and personnel were taken over by the Post Office Department. In June 1919, a service was inaugurated between New York and Chicago, with a stop either way at Cleveland. In 1920, the service was pushed on to Omaha, Nebraska, and a year later New York and San Francisco were bound by air. Airports were established along the route, radio and lighting for night flying and beacons to guide the airmen stretched across the continent. From then on the service began to develop rapidly. Facilities for flying at night were a great advance, and besides the establishments of an overnight air service between New York and Chicago, mail along the extending lines of the post office mail routes were, wherever required, flown at night to keep the letters moving continuously. The whole service was developed by the Post Office with their own planes, personnel and equipment. By a change of policy the lighted highways were turned over to the Department of Commerce and the Post Office ceased to operate its own planes, letting out the route by contract to private enterprise. The route across the continent has been rapidly extended north and south, and there is now a growing network that will soon link every important town in the United States. The saving in time between New York and Chicago is a business

day, and New York and San Francisco are now thirty-six hours apart.

Between May 18, 1918, and June 30, 1927, Post Office planes carrying mail flew 13,594,085 miles transferring 298,517,760 letters, and the greater part of this has been in the last few years. In the last year 2,583,006 miles were flown with only one fatal accident.

The effect of this in developing flying experience in *pilots* has been tremendous. There are dozens of pilots who fly about 100,000 miles during the year in all kinds of weather—summer and winter. The pilot recommended recently for the safety record of the year is Captain Graham who in thirteen months flew 125,000 miles over his regular 589 mile route between Salt Lake City and Los Angeles without a single failure to take the air on schedule and without once being late. He was never once forced down by engine trouble. Dozens of other pilots, known only to the service, have records running from 250,000 to 500,000 miles in the air.

But the greatest miracle of the air service is the spirit it has developed. Not even in the romantic days of the pony express with its wild gallops from station to station, its peril of Indians and desperadoes, and its keeping the schedule to the utmost of human endurance and ingenuity, not even the pluck of those days outshines the spirit of air

mail fliers today, flying in all kinds of weather, and keeping the schedule to the limit of human ability.

"It was true," wrote Lindbergh in the New York Times shortly after his epoch-making flight, "that the flight was thirty four hours long, and that at almost any moment in it a forced landing might be what you might call 'rather interesting' but I remembered that the flying boys I knew back home spent some hours almost every week in bad flying when a forced landing would have been just as bad for them as a forced landing would have been for me. Those boys don't get credit for it, that's all."

That is the spirit of the mail service in which Lindbergh flew during the spring, summer and fall of 1926—his last flying training before the great flight across the Atlantic. Day after day he was flying across the route in all kinds of weather—and such weather as forced him on two separate occasions to make emergency jumps—the third and fourth of his career.

The route between Chicago and St. Louis is not equipped with beacons as on the San Francisco highway—it is a comparatively new route—yet the record Lindbergh and his fellow pilots put up on this route, and its regularity of delivery shows that they maintained the high efficiency of the service. Major Robertson said of this period, "Under his (Lindbergh's) supervision the mail service be-

tween St. Louis and Chicago involved 589 trips, and only fourteen were defaulted owing to utterly impossible flying conditions. 'Slim' often went up when the weather was dangerous for any pilot, no matter how skilled. He flew at least one third of the total of 160,000 miles the St. Louis-Chicago mail pilots tallied last year." A fellow pilot, speaking of this period, says, "I have seen him time and time again fly in weather that would have discouraged almost any other pilot. When the other pilots had given up hope of taking off, 'Slim' would stretch himself, don his flying togs, and in a matter of fact tone say, 'Well, boys, I'm going through,' which meant that he intended to take his mail sacks to their destination, weather or no weather interfering. Soon the roar of his exhaust would tell the others that he was winging his way to St. Louis."

It should be remembered that there were other trips—commercial trips—during this period for Lindbergh, as a part of the day's work.

In this wonder service the transatlantic flier received the final "tuning" for the flight of his career.

It was, as we have said, while flying the mail during the fall of this year that Raymond Orteig's challenge came ringing down eight years to him.

CHAPTER THIRTEEN

EMERGENCY PARACHUTE JUMPS

IT SHOULD be remembered that all four of Lindbergh's emergency parachute jumps were an important part of his training for the transatlantic flight. The risks involved would not have been undertaken with a passenger, and they were only undertaken because his training had given him perfect confidence in his parachute. Incidentally, his simple, direct reports illustrate as no words could, the presence of mind, the cool thought, the instant rapidity with which he puts his decisions into action.

The last two emergency jumps were made while Lindbergh was flying the mail. The first was on September 16, 1926, and the report he turned in of the incident was as follows:

"I took off from Lambert—St. Louis Field—at 4:25 p. m., September 16, and after an uneventful trip arrived at Springfield, Illinois, at 5:10 p. m. and Peoria, Ill. at 5:55 p. m.

"Off the Peoria Field at 6:10 p. m. there was a light ground haze, but the sky was practically clear with but scattered cumulus clouds. Darkness was

encountered about 25 miles northeast of Peoria and I took up a compass course, checking on the lights of the towns below until a low fog rolled in under me a few miles northeast of Marseilles and the Illinois River.

"The fog extended from the ground up to about 600 feet and as I was unable to fly under it, I turned back and attempted to drop a flare and land. The flare did not function and I again headed for Maywood (Chicago air mail port) hoping to find a break in the fog over the field.

"Examination disclosed that the cause of the flare failure was the short length of the release lever and that the flare might still be used by pulling out the release cable.

"I continued on a compass course of 50 degrees until 7:15 p. m. when I saw a dull glow on top of the fog, indicating a town below. There were several of these light patches on the fog, visible only when looking away from the moon, and I knew them to be towns bordering Maywood.

"At no time, however, was I able to locate the exact position of the field, although I understand the searchlights were directed upward and two barrels of gasoline burned in an endeavor to attract my attention. Several times I descended to the top of the fog, which was 800 to 900 feet high, according to my altitude meter. The sky above was

clear with the exception of scattered clouds and the moon and stars were shining bright. After circling around for 35 minutes, I headed west, clearing Lake Michigan, and in an attempt to pick up one of the lights on the transcontinental (air mail route from Chicago to the Pacific Coast which was lighted in that vicinity).

"After flying west for 15 minutes and seeing no break, I turned southwest, hoping to strike the edge of the fog south of the Illinois River. My engine quit at 8:20 p. m. and I cut in the reserve. I was at that time only 1,500 feet high and as the engine did not pick up as soon as I expected, I shoved the flashlight in my belt and was about to release the parachute flare and jump when the engine finally took hold again. A second trial showed the main tank to be dry and accordingly a maximum of 20 minutes flying time was left.

"There were no openings in the fog and I decided to leave the ship as soon as the reserve tank was exhausted. I tried to get the mail pit open with the idea of throwing out the mail sacks and then jumping, but was unable to open the front buckle. I knew that the risk of fire, with no gasoline in the tanks, was very slight and began to climb for altitude when I saw a light on the ground for several seconds.

"This was the first light I had seen for nearly

two hours and as almost enough gasoline for 15 minutes flying remained, I glided down to 1,200 feet and pulled out the flare release cable as nearly as I could judge over the spot where the light had appeared. This time the flare functioned but only to illuminate the top of a solid bank of fog into which it soon disappeared without showing any trace of the ground.

"Seven minutes gasoline remained in the gravity tank. Seeing the glow of a town through the fog, I turned toward the open country and nosed the plane up. At 5,000 feet the engine sputtered and died. I stepped up on the cowling and out over the right side of the cockpit, pulling the rip cord after about 100-feet fall. The parachute, an Irving seat service type, functioned perfectly. I was falling head downward when the risers jerked me into an upright position and the parachute opened.

"This time I saved the rip cord.

"I pulled the flashlight from my belt and was playing it down toward the top of the fog when I heard the plane's engine pick up. When I jumped, it had practically stopped dead and I had neglected to cut the switches. Apparently when the ship nosed down an additional supply of gasoline drained to the carburetor. Soon she came into sight, about a quarter of a mile away headed in the general direction of my parachute.

"I put the flashlight in a pocket of my flying suit preparatory to slipping the parachute out of the way if necessary. The plane was making a left spiral of about a mile diameter and passed approximately 300 yards away from my parachute, leaving me on the outside of the circle.

"I was undecided as to whether the plane or I was descending the more rapidly and glided my parachute away from the spiral path as rapidly as I could.

"The ship passed completely out of sight, but reappeared again in a few seconds, its rate of descent being about the same as that of the parachute.

"I counted five spirals, each one a little further away than the last, before reaching the top of the fog bank.

"When I settled into the fog I knew that the ground was within 1,000 feet and reached for the flashlight, but found it to be missing. I could see neither earth nor stars, and had no idea what kind of territory was below. I crossed my legs to keep from straddling a branch of wire, guarded my face with my hands and waited.

"Presently, I saw the outline of the ground and a moment later was down in a cornfield. The corn was over my head and the parachute was lying on top of the cornstalks. I hurriedly packed it and

started down a corn row. The ground visibility was about 100 yards. In a few minutes I came to a stubble field and some wagon tracks which I followed to a farmyard a quarter of a mile away.

"After reaching the farmyard I noticed auto headlights playing over the roadside. Thinking that someone might have located the wreck of the plane, I walked over to the car. The occupants asked whether I had heard an airplane crash and it required some time to explain to them that I had been piloting the plane and yet was searching for it myself. I had to display the parachute as evidence before they were thoroughly convinced.

"The farmer was sure, as were most others in a three mile radius, that the ship had just missed his house and crashed nearby. In fact, he could locate within a few rods, the spot where he heard it hit the ground, and we spent an unsuccessful quarter of an hour hunting for the wreck in that vicinity before going to the farmhouse to arrange for a searching party and telephone St. Louis and Chicago.

"I had just put in the long distance calls when the telephone rang and we were notified that the plane had been found in a cornfield over two miles away. It took several minutes to reach the site of the crash, due to the necessity of slow driving through the fog, and a small crowd had already assembled when we arrived.

"The plane was wound up in a ball shaped mass. It had narrowly missed one farmhouse and had hooked its left wing into a grain shock a quarter of a mile beyond.

"The ship had landed on the left wing and wheel and had skidded along the ground for 80 yards, going through one fence before coming to rest in the edge of a cornfield about 100 yards short of a barn. The mail pit was laid open and one sack of mail was on the ground. The mail, however, was uninjured.

"The sheriff from Ottawa arrived and we took the mail to the Ottawa Post Office to be entrained at 3:30 a. m. for Chicago."

The second emergency jump, the fourth of his career, was made only three weeks later. He made the following official air mail report covering the incident:

"I took off from Lambert St. Louis Field at 4:20 p. m., November 3, arrived at Springfield, Illinois, at 5:15 and after a five minute stop for mail took the air again and headed for Peoria.

"The 'ceiling' at Springfield was about 500 feet, and the weather report from Peoria, which was telephoned to St. Louis earlier in the afternoon, gave the flying conditions as entirely passable.

"I encountered darkness about 25 miles north of Springfield. The ceiling had lowered to around

400 feet and a light snow was falling. At South Pekin the forward visibility of ground lights from a 150-foot altitude was less than one half mile and over Pekin the town lights were indistinct from 200 feet above.

"After passing Pekin I flew at an altimeter reading of 600 feet for about five minutes, when the lightness of the haze below indicated I was over Peoria.

"Twice I could see lights on the ground and descended to less than 200 feet before they disappeared from view. I tried to bank around one group of lights, but was unable to turn quickly enough to keep them in sight.

"After circling in the vicinity I decided to try to find better weather conditions by flying northeast towards Chicago. I had ferried a ship from Chicago to St. Louis in the early afternoon and at that time the ceiling and visibility were much better near Chicago than elsewhere along the route.

"Enough gasoline for about one hour and ten minutes' flying remained in the main tank and twenty minutes in the reserve. This was hardly enough to return to St. Louis even had I been able to navigate directly to the field by dead reckoning and flying blind the greater portion of the way.

"The only lights along our route at present are on the field at Peoria, consequently, unless I could

Wide World

The mail plane from which Lindbergh made his fourth parachute jump.

Wide World

Lindbergh at military school.

pick up a beacon on the transcontinental route my only alternative would be to drop the parachute flare and land by its light together with what little assistance the wing lights would be in the snow and rain. The territory toward Chicago was much more favorable for a night landing than that around St. Louis.

"I flew northeast at about 2,000 feet for 30 minutes, and then dropped down to 600 feet. There were numerous breaks in the clouds this time and occasionally ground lights could be seen from over 500 feet. I passed over the lights of a small town and a few minutes later came to a fairly clear place in the clouds. I pulled up to about 600 feet, released the parachute flare, whipped the ship around to get into the wind and under the flare which lighted at once, but instead of floating down slowly, it dropped like a rock. For an instant I saw the ground, then total darkness.

"My ship was in a steep bank and for a few seconds after being blinded by the intense light, I had trouble righting it. I then tried to find the ground with the wing lights, but their glare was worse than useless in the haze.

"When about ten minutes' gas remained in the pressure tank and I still could not see the faintest outline of any object on the ground I decided to leave the ship rather than attempt to land blindly.

"I turned back southwest toward less populated country and started climbing in an attempt to get over the clouds before jumping. The main tank went dry at 7:51 and the reserve at 8:10. The altimeter then registered approximately 14,000 feet yet the top of the clouds was apparently several thousand feet higher. I rolled the stabilizer, cut the switches, pulled the ship up into a stall, and was about to go over the right side of the cockpit when the right wing began to drop. In this position the plane would gather speed and spiral to the right, possibly striking my parachute after its first turn.

"I returned to the controls and after righting the plane, dove over the left side of the cockpit, while the airspeed registered about 70 miles per hour and the altimeter 13,000 feet.

"I pulled the rip cord immediately after clearing the stabilizer. The Irving chute functioned perfectly. I had left the ship head first and was falling in that position when the risers whipped me around into an upright position and the parachute opened.

"The last I saw or heard of the D. H. (his airplane) was as it disappeared into the clouds just after my parachute opened. I placed the rip cord in my pocket and took out my flashlight.

"It was snowing and very cold. For the first minute or so the parachute descended smoothly,

then commenced an excessive oscillation which continued for about five minutes and which I was unable to check.

"The first indication that I was near the ground was a gradual darkening of the space below. The snow had turned to rain and although my parachute was thoroughly soaked, its oscillation had greatly decreased.

"I directed the beam of the 500-foot spotlight downward but the ground appeared so suddenly that I landed directly on top of a barbed wire fence without seeing it. The fence helped to break my fall and the barbs did not penetrate the heavy flying suit.

"The parachute was blown over the fence and was held open for some time by the gusts of wind before collapsing. I rolled it up into its pack and started toward the nearest light.

"Soon I came to a road which I followed about a mile to the town of Covell, Illinois, where I telephoned a report to St. Louis and endeavored to obtain some news of where the ship landed. The only information that I could obtain was from one of a group of farmers in the general store, a Mr. Thompson, who stated that his neighbor had heard the plane crash but could only guess at its general direction.

I rode with Mr. Thompson to his farm and after

leaving the parachute in his house, we canvassed the neighbors for any information concerning the plane. After search for over an hour without result I left instructiaons to place a guard over the mail in case it was found before I returned and went to Chicago for another ship.

"On arriving over Covell the next morning I found the wreck with a small crowd gathered about it less than 500 feet back of the house where I had left the parachute.

"The nose and wheels had struck the ground at about the same time and after sliding along for about seventy-five feet it had piled up in the pasture beside a hedge fence. One wheel had come off and was standing inflated against the wall on the inside of a hog house a hundred yards further on. It had gone through two fences and the wall of the house.

"The wings were badly splintered but the tubular fuselage, although badly bent in places, had held its general form even in the mailpit. The parachute from the flare was hanging on the tailskid.

"There were three sacks of mail in the plane. One, a full bag, from St. Louis, had been split open and some of the mail oil-soaked but legible. Two were only partly full and were undamaged.

"I delivered the mail to Maywood by plane to be dispatched on the next ship out."

PART V

LINDBERGH, THE LONE SCOUT

" 'Be Prepared' must include mastery of all the details of one's work.

"When one *knows* he should go ahead and *do*."

LINDBERGH.

THE LONE SCOUT OF THE SKY

LINDBERGH was never a member of the Lone Scouts or the Boy Scouts of America. He has said that when he was fourteen years of age he had been eager to become a member of a troop of Boy Scouts in Washington, D. C., that he had prepared his Tenderfoot Tests and was all ready to join the troop when his parents moved from Washington, and that the opportunity of becoming a Scout had never come to him again.

We are not sure that he had even heard of the former organization, but in a very real sense Lindbergh was a Lone Scout. One of his earliest games was playing the lone scout, with the elm that stood outside the Lindbergh home, serving as the lookout post. From this fastness his eyes swept the horizon in every direction for the hostiles. The Scout in the tree was sometimes lone Indian and sometimes lone pioneer. This idea of the lone scout, consciously or not, motivated several of his later activities — riding horseback, shooting with deadly accuracy, long days spent in the woods and on the lake.

In a deeper sense too he was the lone scout, for it was in his boyhood that he had learned the loveliness of solitude, and to carry out in his life the dual purpose of Lone Scouting as it is administered by the Boy Scouts of America — complete self-reliance, and at the same time, the desire, the will to share in the work of the community's welfare.

Lindbergh's great feat, though done alone, was done "for the good of aviation."

CHAPTER FOURTEEN

HIS PARENTS

LINDBERGH was born in Detroit, Michigan, February 4th, 1902, at the home of his grandfather, Dr. C. H. Land, a well known dentist of that city. A few weeks later he was bundled up and taken home by train to the Lindbergh homestead at Little Falls, Minnesota, where most of his roving life was to be spent.

His mother, Mrs. Evangeline Lodge Lindbergh is now a teacher of chemistry in the Cass Technical High School at Detroit, Michigan. She took a science degree at the University of Michigan, and after post-graduate work at Columbia University, New York, although it was not necessary for her to do so, took a position as teacher in the High School at Little Falls, Minnesota. Here she met and married Charles Augustus Lindbergh, then practicing law at Little Falls, where the family had lived on its homestead three generations.

Lindbergh had an exceptional inheritance from both of his parents. His father had been bred of hard pioneering stock, a man of exceptional courage and sense of public service. He was five times

elected to serve as a member of the National Congress from his district, and had been a candidate for Senator and Governor of the State, being defeated but carrying an unpopular cause with so much dignity and courage as to win a personal tribute even from those who at the time bitterly opposed him. From him the Lone Eagle probably inherited that deep rooted courage, superhuman endurance, and that ability to retire within himself and work out his problems. In a very real sense there grew up between father and son a warm and understanding friendship. They would walk the woods together, and once, when Lindbergh was only ten years of age, father and son set out on the great adventure of taking a boat up the headwaters of the Mississippi, that ran by their door—an adventure that lasted all summer long. In all manner of little ways, the father helped in the training of the lone scout. With him the boy learned to know something of the joy of silence, and the companionship of being alone—which most men fear — with nature.

The elder Lindbergh was a poet. A congressman with whom he had made a trip to the Panama Canal recalls a conversation, a conversation called out by the magic of a tropic night on the blue waters of the Caribbean, when the elder Lindbergh had talked of poetry, and recited some of

International News Reel

One of the few photographs of Lindbergh wearing his decorations.

Courtesy Missouri Historical Society

Col. Chas. A. Lindbergh's Decorations and Trophies, 1927.

his verses, bemoaning the fact that the perfect expression wasn't his. "But I have a son," he said. "He is only five years old now, but I often plan great things for him. I want him to be a poet, and I have a feeling that he will be. Yes, my son will express the poetry that I do not know how to express." Little did he dream that his son was to write a saga in the air!

When the genius of the younger Lindbergh began to run to machinery, however, his father — always careful to give the lone scout his right of thinking out his ideas and then putting them to practice — "gave the youngster his head" with what seemed to some over ready compliance to the fool notions of a kid.

Lindbergh, the elder, had been opposed to the flying business for his son, but had promised to take a ride in the air at the first opportunity. When the proud owner of the ex-Army Jenny came home from Americus, Ga., with a knapsack full of adventures across country, the airman headed it for Marshall where his father was conducting his campaign for U. S. Senator. They had had adventures on the land and on the water together, and so one fine afternoon, father and son climbed into the airplane, and took their first air trip together, flying over Redwood Falls. There was not a word against flying after that — indeed, the lone scout

— the Lone Eagle now — stayed to fly his father about in the campaign he was making. When his father died, the younger Lindbergh hurried home from his flying in the West. The elder Lindbergh's last wish had been that his ashes be taken up by his son and scattered over the Lindbergh homestead.

If there had been deep friendship between father and son, no word but devotion describes the relation between mother and son. The frequent moves of the Lindbergh family between Little Falls and Washington, with trips to Detroit, Minneapolis, Panama, across the Continent to California, meant that school was being constantly interrupted. Up to the time he went to high school, the young Charles had attended more than a dozen different institutions. It was Mrs. Lindbergh, a trained teacher, who supplemented this intermittent schooling, and did it so well, that when High School came Charles was able to do it in three and a half years instead of the regular four. Quite apart from supplementing his ragged schooling, his mother's influence had been strong in the training of the Lone Scout, for in every way he was encouraged to think and act for himself. There had never been any tendency to bind him to hard and fast rules, and spanking was quite unknown in the Lindbergh household. These two, mother and son,

had been close companions, the boy talking over with her many of his plans — such as taking up flying — and finding in her always a deep sympathy and understanding. Up to the time he began flying they had been constantly together. One of the first things the youthful owner of his first Jenny had done, after he had convinced his father on the flying business and carried him about in his campaign, was to wire his mother to meet him at Janesville in Southern Minnesota. Here for ten days they had barnstormed together, and she had become an enthusiast. She has ridden with him at other times, once making a round trip between St. Louis and Chicago in the mail compartment of his plane.

Since the Transatlantic flight, every effort has been made to exploit her, and she has met these with the same grave courtesy that her son has shown in refusing to lend herself to any such thing. Indeed, while she has always believed that her son would make the flight he had planned, and would have been willing to go with him had that been possible, she has felt that her son's flying career has been peculiarly his own — entirely planned and carried out by himself, and has refused to undertake anything except as he requested it, and except it lent itself to the "cause of aviation" her son has so near his heart.

A rare example of a woman and of a mother! She had bid him good-bye without a tear, she had stuck to her teaching on the first anxious day of his flight, and alone she had faced the night and day of anxiety that had followed. "Splendidly well done" were her words when news of the heroic triumph was sent to her. Lindy's first wish when he awoke after his gruelling endurance was to "hop over to London and talk to Mother on the new transatlantic phone." Her first words to him were "how do you feel." Her admonition to him was "take care of yourself and see that you get plenty of rest."

Worthy mother of a heroic son — worthy son of a heroic mother!

CHAPTER FIFTEEN

LONE SCOUT TRAINING

THE Lindbergh homestead is about two miles from the town of Little Falls. It consists of about two hundred acres. The Mississippi River runs along its eastern boundary. There is a lake and creek on the farm, and sections of it are deeply wooded. When Lindbergh first came home to it, there was a spacious mansion, destroyed two years later by fire, and replaced by a much more modest structure which now stands on it.

Lindbergh's earliest years were spent here mostly. He was always big for his age, and has never known illness, except for an attack of measles, when he was quite little, and a threatened attack of influenza some years later. Even at this time the family stayed frequently in Minneapolis, and every now and then trips were made to Detroit to the home of his grandfather, Dr. C. H. Land.

Dr. Land is known in the dental world as "the father of porcelain dental art." He also held a number of patents on dental processes, as well as incandescent grates and furnaces. A friendship sprang up between the man and the little boy, and

in his grandfather's laboratory Charles not only found a welcome, but delighted to watch the "wheels go round." Mrs. Lindbergh says that the youngster spent hours here, and that he probably got his first interest in mechanics from watching his grandfather work.

When he was four years old his father was elected to Congress, and in the next ten years winters were spent in Washington, and summers at Little Falls, with trips in between to Detroit, Panama, and many other places, developing in the boy a love of travel which he has never outgrown. Charles went to Congress with his father, not merely accompanied him to Washington. Mr. Arthur Gorman, who was Congressman Lindbergh's private secretary, says of Charles: "He was the favorite of all the Congressmen. He was a tow-headed lad, big for his age, who got a big kick out of going to Congress with his father. Although ordinarily he was a bashful youngster, he seemed to get great delight in tugging at the coat tails of every Congressman."

From four to fourteen the family moved regularly between their two homes. As he began to grow up he was largely the schoolboy in Washington, and the Lone Scout at Little Falls, and there is no doubt of his preference. Here in the woods and around the farm he could wear the clothes he

liked — khaki shirt opened at the throat, a pair of overalls, or old trousers with a comfortable feel to them.

Visitors at the Lindbergh homestead note among the beautiful trees that grow around the house, an ancient elm. There is a long row of cleats driven into it, leading upward. This was the famous look-out post of the Lone Scout. From there his eyes would sweep the river and the plains and no hostile ever got past the barrier guarded by those watchful eyes!

But to shoot accurately and to ride well — these became two necessary things in his game. His father taught him the use of rifle and revolver — invaluable training for a steady eye and accurate hand — and before he was far advanced in his 'teens Lindbergh was a good shot. There were horses on the farm, of course, but the lone scout not only wanted to ride but ride well, and he went at it with a zest and persistence that gave his mother some anxious moments. It is not difficult to imagine that Lindbergh would take a fall and come again!

You might have noticed that among Lindbergh's emergency equipment on his famous flight was some fishing tackle. If the Lone Eagle had been forced to fall back on his deep sea line for food,

he would again have found his lone scout training come in mighty handy, for he was only a youngster when he learned the art of fishing — an art he has never lost interest in.

But a lone scout is, of course, in his element when he is treading softly through the woods. Boy and dog — Lindbergh had a dog, of course! — would disappear all day in the woods, or paddle in the lake in his home-made boat. These were great days, but great training also, for he was learning to take care of himself under conditions that became invaluable in later years.

And there was that great adventure when he was ten years old. Father and son, all alone, going up the Mississippi to its headwaters. Their camping equipment and their provisions piled neatly in the craft — we wonder if Lindbergh ever got the same thrill out of anything else in his adventurous after years. They were gone weeks, making camp and breaking it, to go on further, and by the time they came back to the old landing at the farm, they had covered more than two hundred miles.

To those who did not know of Lindbergh the lone scout, it seemed surprising that the Lone Eagle went about his preparations for long journeys with such a minimum of fuss, and with such a complete disregard for the luxuries of journeying

Wide World

Lindbergh with his mother at New York just before the historic flight.

Wide World

Lindbergh, aged eight, with his father who was then serving as a Congressman in Washington.

— especially of food — when he set out. Be it remembered that Lindbergh is a handsome eater — indeed among his comrades of the airways his appetite is something to be noted with astonishment. When he began his career as an airman he would strap on his kit, and take off anywhere. All the time he needed to go anywhere was the few minutes it was necessary to tune up his engine. It was the Lone Scout, with his experience of camping, and taking care of himself in the open and living in it in all kinds of weather that had enabled the Lone Eagle to do that. This was the free, open life that he loved, and it played an important part in his choice of a profession, and in the success and endurance he later developed in his chosen calling.

Lindbergh had always been a big boy for his age, and in physical appearance he seemed four or five years older than he really was. This rapid growth was probably responsible for the description of many who knew him through his boyhood and early manhood "as gawky, gangling, countrified," and also for the fact that he never seems to have had any "buddies" of his own age. It was not until he was twenty-two or three years of age that his 6 ft. 2 in. and 178 pounds began to knit into the fine figure of control and poise he now makes. The easy manner in which he carries himself, and the

tendency to lean slightly forward, when he is interested and in conversation, makes him appear less tall than he really is.

As we said, his schooling had been of an extremely ragged nature. In Washington he had attended the Force School, the Friends' Academy, and military school. At the Friends' Academy he had been known as "Cheese" Lindbergh. The Lincoln Grade school of Little Falls, knew him as "Chuck". These were the only two nicknames he seems to have acquired in his boyhood.

Lindbergh was ten years old when he saw his first airplane, and he was fascinated by it. It was probably the beginning of his interest in flying. What effect this had on him at this time we do not know and Lindbergh says that the stories of his playing at flying and dreaming of it from the tree tops, have no basis whatever in fact, any more than the stories of the dexterity he acquired in the making of toy parachutes and balloons. There is a practical twist to everything Lindbergh did even in his boyhood and a too fanciful picture gives a wrong impression even of his play.

It was during this period of Lone Scouting that Lindbergh qualified for one of the requirements of the Merit Badge on Pioneering. Driving the cows home was a part of his farm job, and the pasture lay across Pike Creek, the twenty-foot stream that ran

across the Lindbergh homestead. Across the creek it was necessary for him to wade, overalls rolled up, in the wake of the cows, and the Lone Scout finally tired of getting the ends of his pants wet. So he built a bridge of fence wire, anchored it with some fence posts, and thereafter crossed the creek with dry feet. He was then thirteen years of age.

CHAPTER SIXTEEN

MACHINES

One of Lindbergh's earliest loves had been a bicycle. If Lindbergh had been able to carry out his wish to become a Scout at fourteen — his father's last term in Congress — the Merit Badge for Cycling is one of the things he would have been able to take easily. No one knows where that bicycle came from. Lindbergh seems always to have had it. It had no mud-guards, and it appears to have been of an ancient vintage. But under his gentling hand it worked, as every other machine has worked, like a dream, and he rode it the two miles from the homestead to the town, at a sure clip. When the rains muddied the road, he kept it from skidding with wire wound round his tires. His teachers at school in Little Falls remembered him not for the brilliancy of his recitations but "as the boy that rode the bicycle." From cycle he graduated to motor cycle, that roared where once his long and sturdy legs had been required to make speed. Be it said that never once did Lindbergh have an accident with cycle, motor cycle or automobile, and the four parachute jumps of his flying

career cannot even by a stretch of imagination be described as due to recklessness.

He was born to the machine. He knew every bolt and screw of his motor cycle and he knew every bolt and screw of his father's automobile. He was fourteen when his father, having resigned from Congress wanted to make a business trip to California. Father, mother, uncle and son, set out on the boy's second great adventure — a trip across the continent and back in the family Saxon. The mechanic to this expedition was Charles A. Lindbergh, Jr., and he it was who did most of the driving. Although the Saxon had seen its best days when it set out on this trip, the family mechanic sufficed, except on two occasions, when outside help had to be called in.

Two years later, when the elder Lindbergh was carrying on his campaign for Governor of Minnesota, the Lone Scout was acting as official chauffeur to his father — this time in a newer and larger car.

These were the years of his High School — three and a half years from thirteen to sixteen. In these years he did an extra half year's work, and as with everything he did, it was thorough. No one recalls him in the years of his boyhood or early manhood as brilliant in anything he did. They speak of him as student and flyer of being good, and

thorough. In these school years at Little Falls everybody remembers him as they do the Lindbergh family, but they can recall very little about him. His first motor cycle — a one-cylinder Excelsior — was his great love now, but he was still the Lone Scout, finding most of his pleasures out-of-doors, with a succession of dogs and horses as pets, and of course, the old comradeship between father and son, and mother and son.

He graduated from high school in 1918 without any furore. There is no record of his taking part in any of the Commencement exercises, and he hadn't displayed the slightest interest in athletics, although physically he was well qualified to have played such a part had he had any desire to do so. He had gone in strong for manual training and mechanics, and was reported good in civics and American history.

With his graduation at sixteen he took over the farm. But what Lindbergh was interested in was not so much farming, as machinery to farm with. There began to gather on the Lindbergh homestead every conceivable device in machinery that could help the farmer. Mark Engstrom, who runs the hardware store at Little Falls, probably the most interesting spot in town to Lindbergh, for there always was some machine about the store, tells of a tractor he ordered for the Lindberghs:

"I sent away for the tractor and pretty soon it arrived in Little Falls. Naturally I had figured on setting it up for the boy, but do you think he would stand for any meddling? No, siree! He told the men to unload it and then ordered us all to step aside. He worked on the machine for two days and then said he was ready to start. And what is more, the bloomin' thing did start and he was the proudest boy in all Minnesota as he drove it down the street. Pretty good, I'd say, for a chap who had never seen a tractor before."

"He was a good boy," says Engstrom. "Never made a bit of trouble. Awfully quiet, but what he knew about machinery even as a youngster was a caution!"

CHAPTER SEVENTEEN
COLLEGE

IN 1920 Lindbergh went to College. He was then 18. Both his father and mother had been graduates of the University of Michigan. The State University of Minnesota is only a few miles away from his home. The Lone Scout had been accustomed all through the years of his life to do his own thinking and make his own choice. He had picked the University of Wisconsin, for it was reported that the College had good courses in mechanical engineering.

His mother went with him to Madison, took an apartment and a position as teacher, and stayed with him the three semesters he was in attendance at the University.

Lindbergh had been living mostly in the out-of-doors. His preference in a costume was a khaki shirt, open at the neck, and a pair of overalls. He was not socially inclined. He did not drink or smoke. He was not in the least interested in dates with girls, and he didn't care a rap about athletics. Moreover he had been used to finding the shortest way between two points, and what he wanted was mechanical engineering, and the college routine required him to tackle a number of others in which he was only indifferently interested.

The home town, Little Falls, Minnesota, welcomes its most distinguished native son.

International News Reel

Scouts at Roosevelt Field (inset) Eagle Scout James Campbell who carried the message to Lindbergh announcing his election as an honorary scout.

The mechanical engineering feature of the curriculum was fine. He brought to his problems not only his interest and thoroughness, but he became deeply absorbed in them, and would work long hours in the laboratory to solve them. When he had completely mastered them, however, his interest was through. Turning in a report was a grind, and seemed a little unreasonable, for he had already mastered it, and all he could tell the professors in a report the professors already knew!

We need a new kind of college for our Lindberghs — the boys who come there impelled by a single compelling interest, and want the opportunity to work it out to the full.

Two activities outside the regular university routine, however, proved of absorbing interest to Lindbergh. He had joined the R. O. T. C. He had found a place on the rifle and pistol teams of the university in his freshman year, and as there were many matches between the university and its rivals, he kept himself constantly practicing at the range and the shooting galleries. One of his proudest possessions is a pistol presented to him by the Reserve Officers Training Corps of the university.

At the end of his freshman year he went into camp with them at Camp Knox, Kentucky, and when that was over rode his motorcycle to Jacksonville, Florida, and back to Madison in seven-

teen days, overhauled it and rode it to Little Falls.

Be it also recorded that the Lone Scout built his own ice-boat the following year during his third and last semester at Madison. Seeing an ice-boat being built by two of his fellow students had fired his interest, and as they offered him the use of their workshop, most of the hours outside of school were spent here. The keel of each boat was fitted with a motor cycle engine driving an airplane propeller. When the winter froze Lake Mendota, they took the boats over and launched them — the mother of Delos Dudley, the owner of the basement workshop, gives us a picture of Lindbergh as he appeared to her at this time:

"Both Lindbergh and Plummer were shy fellows, and I recall that frequently they came to the house when Delos was away. I would hear a ring at the door and upon answering I would find the two boys standing at the foot of the porch steps arguing as to which should go up the steps first. Often I would ask Delos if he cared to ask his friends to stay for lunch, but he invariably replied that Lindbergh was too bashful, so I'd set out some bowls of bread and milk or some sandwiches and when I wasn't looking they would come and get them. He was a bashful boy but a very good boy, always polite, never a rowdy."

In the trials Dudley says he distinctly remembers

that Lindbergh's boat was the faster of the two. He also recalls Lindbergh's boat being smashed while it was lying in dock by another boat and his being not only disconsolate but angry. He searched all around for some evidence and found a splinter of wood that did not belong to his boat. With it he started the rounds of every boathouse on the lake, and eventually found a boat that was smashed, and into which the splinter of wood he had found fitted exactly. The crowning scout touch! He demanded a settlement and obtained it.

But University was not giving Lindberg what he wanted — it was not carrying him in the direct way to where he wanted to go. He talked it over with his mother. He was going to learn to fly, and if it seemed to be a calling with a future, he would make it his life's job. He had been encouraged since he was a little boy to do his own thinking, and this must have seemed to his mother, with her background of academic training, a disastrous step. But he had always found her sympathetic and she listened with interest. Catalogs of air training courses came from all over the country, and Lincoln was decided upon.

And so on a morning at the end of March, 1922, a motor cycle went roaring out of Madison bearing a young man who was going to learn to fly.

The Lone Eagle had begun to feel his wings!

PART VI

AFTERMATH

I have the honor to present . . . America's most attractive citizen.

SPEAKER LONGWORTH to the House of Representatives.

CHAPTER EIGHTEEN

THE CAUSE OF AVIATION

ICH DIEN (I serve)—the motto of the Prince of Wales.

How long is the public life of a hero? The public is notoriously fickle. It makes a man a hero today, and tomorrow shows a complete indifference in him. It will even jeer at him on occasion. Many a popular idol has found "the higher they go, the harder they come down" was true to the point of bitterness.

Perhaps to this fickleness of the public is due the craze to capitalize one's popularity—if the gods are fortunate enough to bestow it—for what one can get out of it in dollars and cents. Perhaps, on the other hand, this is the cause and the other, the effect. Be that as it may, Lindbergh was too earnest about the future of his good cause—aviation; too firmly grounded in the relative importance of things—of the important values in life, to give himself up simply to money-making. The test of everything that came before him was—will it serve the cause of aviation?

A conservative estimate of $6,000,000 has been made as the amount Lindbergh could have earned had he chosen to accept business propositions and movie contracts, legitimate and honorable enterprises, that were offered him. These were all declined, courteously as usual, but firmly. He chose instead to make a tour of the country under the auspices of the Guggenheim Foundation for the Promotion of Aviation. To show himself and his beloved *Spirit of St. Louis* (we have come to regard plane and pilot as national possessions), to be greeted with wild and unvarying cordiality, and to make his little plea for airports, which will do for the airplane what good roads did for the automobile.

Lindbergh's tour was in itself a record breaker. The plane, with the same engine, was flown 22,000 miles without a single mishap of any kind. An overnight stop was made in each of the forty-eight states. When it is recalled that at 68 of these stops the Lone Eagle was required to make his landing at precisely 2 o'clock in the afternoon—and that he never failed to keep that schedule, except on the one occasion when fog blanketed Portland, the startling reliability of pilot and plane is at once evident. It is estimated that more than 30,000,000 people saw Lindbergh on that tour through the country. Far more people have looked

on him, cheered him, than have ever looked on any one man since the dawn of history.

What that flight has meant in terms of the increased use of the airmail service, in airplane passenger traffic, in the building of airports, in the added demand for flying machines it is impossible to estimate. During the short course of his tour every phase of aviation made an astounding jump in public interest and use. But it was merely the beginning. It would be no exaggeration to say that Lindbergh pushed the cause of aviation five to ten years ahead of its ordinary course of development.

Aviation had made Charles Lindbergh famous, and Lindbergh took that fame, as in his hands, and gave it back to the cause of Aviation. And that is why the mortality statistics on the public life of a hero need to be revised in the case of this Lone Scout of the Sky.

CHAPTER NINETEEN

HONORS

THIS attitude of Lindbergh's in placing himself in service to a great cause, instead of detracting from his personal fame, served merely to add to the public's interest in him. Had New York been given a chance it would have demonstrated as wild an enthusiasm for him on his return from the country-wide tour as it did on that eventful day in June when he came from up the Bay to receive the greatest welcome that Father Knickerbocker had extended to any man in history. Everywhere he appeared there were impromptu demonstrations, and to give him a minimum amount of rest, he had to be most carefully guarded. It was announced, shortly after the conclusion of his tour, that he would remain on the staff of the Guggenheim Foundation for the Promotion of Aviation with absolute authority to undertake anything, or to devote his time to any cause he felt would further the cause of Aviation. Needing a vacation, he went to Selfridge Field, Dayton, Ohio, assigned to a flight squadron, to find rest and relaxation in the routine of military aviation.

But twice in this period he was drafted for special honors. The first of these occasions was celebrated in Washington on November 14th, 1927. To a luncheon with Col. Lindbergh at the White House, the President and Mrs. Coolidge had invited the famous transoceanic fliers of 1927. Commander Richard E. Byrd with his associates in the *America's* flight to France, Bert Acosta, George Noville and Berndt Balchen were there; Clarence D. Chamberlin with his transatlantic passenger, Charles A. Levine; the team of William S. Block and Edward H. Schlee, who had taken a Stinson-Detroit plane over the ocean and as far as Tokyo, and who ruefully gave up their ambition for a round-the-world travel record; the heroes of the Pacific, Lieuts. Maitland and Hegenberger of the army's carefully planned flight; Ernest L. Smith and Emory B. Bronte, who followed them and had to make a forced landing; Arthur C. Goebel and William V. Davis, Paul Schulter and Martin Jensen, the winners and only survivors of the tragic Dole race from San Francisco to Hawaii; and last, though by no means least, the only woman present, Ruth Elder with her pilot-navigator, George Haldeman, who was responsible for one of the finest feats in an eventful aviation year.

That evening at the Washington Auditorium in the presence of 6,000 people, including the dis-

tinguished aviator guests at the White House luncheon, and officials of the national Government, and the Diplomatic Corps, President Coolidge presented Col. Lindbergh with the Hubbard Medal of the National Geographic Society—the medal of explorers. In the forty years of the history of the Hubbard Medal it has been awarded to only seven others—Peary, Amundsen, Gilbert, Shackleton, Steffansson, Bartlett and Byrd.

The President in bestowing the medal said:

"Fellow countrymen: Transportation and communication are essential to civilization. Within the year an encouragement has been given to their development that has few parallels in history. The principles of aviation were demonstrated first by Americans at the turn of the last century. In the intervening years their science progressed, both here and abroad. Important flights were made.

"It remained for one of our own citizens, in May, 1927, to arouse universal interest in the practical possibilities of travel through the air. His flight, alone and unaided, from New York to Paris, thrilled the world. It appealed to the imagination of humanity. How the hero of this exploit was revealed, not as a reckless adventurer, but as an able, sober-minded, modest young man of high and unselfish purpose, has now passed into history. What he did to strengthen the cordial relations

between our people and Europe is well known. The wonderful and sincere welcome he received abroad, the acclaim that greeted him at home are still fresh in the public mind.

"But that was not all. With a clear conception of public service, he determined to capitalize his fame, not for selfish aggrandizement, but for the promotion of the art he loves. He was unmoved by the many opportunities for private gain. The flight to Europe was spectacular. It stirred the hearts of the people, but foremost in his mind was the permanent good that might come from thus having directed public thought to human flight. This courageous, clear-headed, sure-handed youth, whose character had withstood the glare of publicity and the acid test of hero-worshiping adulation, became an apostle of aeronautics. He dedicated himself to advancing the science and practice of aviation.

"Taking little time to recover from the strain of his experiences, he started on a missionary tour of over 22,000 miles. Flying in his *Spirit of St. Louis,* the "Spirit of America" visited eighty-two cities in our forty-eight states. Only once did he fail to arrive on schedule time, establishing a record for reliability. He spoke, not about himself but for airways and airports, in 147 speeches and 192 messages dropped from the clouds. Because of

what he has said and done, we are told aeronautic plans for 1928 indicate an activity far beyond any dreams of six months ago.

"Colonel Charles A. Lindbergh, it has been the privilege of few to do as much for a cause in such a short period of time. You have richly merited the many honors already bestowed. Tonight I have the utmost gratification in awarding you this further recognition of achievement, the Hubbard Medal of the National Geographic Society."

Lindbergh's response was characteristic of him. In his brief reply he expressed gratification for the honor; appreciation of what the National Geographic Society had done in aiding the development of aviation; and finally affirmed his hope and belief in the part aviation would play in future exploration.

The second of the occasions to which we refer was the reception accorded to him by the House of Representatives and the awarding of the Congressional Medal of Honor "for heroic skill and courage as a navigator." That honor—the breaking of all precedents to receive him, the spontaneous enthusiasm of the legislators—must have touched him. For it was in these same halls that his father had championed many a worthy cause. As a little boy there had been the thrill of "coming to Congress" with his father.

The remarkable feature about Lindbergh's reception by the House of Representatives was its spontaneous character. On December 10th, 1927, while preparing in Washington for his flight to Mexico, he went to the Capitol to attend a meeting of the House Committee on appropriations concerning aviation. Hearing about this the House immediately went into recess, and appointed the floor leaders of the Republican and Democratic parties a committee to invite Lindbergh to the House. As he came in, flanked by the committee, he was greeted with a deafening roar of applause from the floor and galleries. Speaker Longworth took him upon the dais and introduced him to the House with these words:

"I have the honor to present to the House of Representatives America's most attractive citizen."

Lindbergh stood on the Speaker's dais alone, as the House turned court, and members and workers and spectators formed a line to come up and shake hands and congratulate him. No sooner was he out of the chamber than the House, dispensing with the formal rules, passed by unanimous consent a bill conferring on him the Congressional Medal of Honor. Two days later the Senate confirmed the action of the lower House.

It also might be mentioned in passing, as show-

ing the hold Lindbergh had on "all sorts and conditions" of people that the question "Who would you like to be if you were not yourself?" put to 682 high school students in Belleville, N. J., elicited a vote of 363, well over half, for Lindbergh, the balance of 319 votes being scattered among 21 others, President Coolidge having a generous lead with 66.

St. Joseph's College, Philadelphia, awarded Lindbergh his first honorary degree—Master in Science of Aeronautics—on Nov. 13th.

And . . . The International Aeronautical Federation awarded its gold medal for the outstanding feat in aviation during 1927 to Col. Charles A. Lindbergh.

CHAPTER TWENTY

AMBASSADOR OF THE AIR

I like Mexico . . . If the flight does anything to improve the relations between the United States and Mexico, it will make me happier than anything else. That was the chief purpose of the flight.

LINDBERGH in the New York Times.

THE world felt something of the old thrill when news of Lindberg's take-off on a 2,000 mile non-stop flight from Washington to Mexico City was flashed over the wires. It was the first time an attempt had been made to bridge the air space between the capitols of the two republics. It had dangers all its own. *The Spirit of St. Louis* had been flown nearly 40,000 miles. It was still powered with the same faithful Wright Whirlwind that had carried Lindbergh on that history-making flight between New York and Paris. Grinding two of the valves and some minor adjustments was all the overhauling the engine had required.

And there was drama to the flight. On December 13th the Weather Bureau had reported fog, rain and showers, and that better conditions could

not be expected for several days. The weather not being too severe, Lindbergh determined to start at once, rather than wait the week that would probably be required for ideal conditions. Heavy rain had fallen overnight, but the Lone Eagle carefully chose and marked out a runway from which he felt he could take off with his heavy load. He carried between 300 and 350 gallons of gasoline as compared with 451 he carried on his transatlantic flight. At 12:26 he started out. The plane was some time in gathering speed, and the crowd watched him anxiously for fear he would not gain sufficient altitude to clear the hangars and trees. But Lindbergh with the sure feel of the plane merely remarks that the tail skid clung to the mud for a little while, but once it came free, lifted easily. In two minutes from the take-off he was traveling at 105 miles an hour and in a few minutes more was waving good-by to his escort.

The route he had planned was almost a direct line from Washington to Galveston, Texas, cutting through the states of Virginia, Tennessee, Georgia, Alabama, Mississippi and Louisiana. From Galveston he planned a bend that would follow the coast to Tampico, and from then on a straight compass course to Mexico City. He could have cut the distance about a hundred miles by flying over the Gulf, but believed it was an

unnecessary and foolhardy thing to attempt a water route in a single-engined land plane, when a land route was available.

Fog and rain, which the Weather Bureau had predicted he certainly found, forcing on him the necessity of "flying blind" for five hours, a considerably longer period than was necessary on his transatlantic flight. He kept his course faultlessly, checking his course every now and then, until diving through the clouds he was able through the fog to recognize Tampico by its large oil tanks.

Despite the weather he had been running pretty much to the schedule he had planned. Tampico is only about 250 to 300 miles from Mexico City. The entire flight was expected to last 24 hours. With the hour's difference in time between the two cities Lindbergh hoped to reach the Mexican Capitol about noon.

A great crowd began to gather at Valbuena Flying Field. Every detail for the reception to the lone flyer had been completed. But minute dragged on minute and hour on hour and it seemed that tiny speck over the rim of the hills eagerly watched for would never appear. And then suddenly a message of cheer. The Mexican Army escort wheeled their planes for the take-off to bring the ambassador of the air to their city.

Lindbergh had been lost. In the fog he had

GOOD NEWS!

—Harding in the Brooklyn *Eagle*.

POOL-ROOM COMMENT

—Thomas in the Detroit *News*.

drifted from his course, and he found it next to impossible to identify the terrain. Diving out of the fog when by his compass he should have been over Mexico City he could not check his position. His maps, bought in the United States, were faulty. He found it difficult to read the names on the railroad stations. So he wandered around until he read the name of a little town near Mexico City, which by that act became in a moment internationally famous—Toluca. It was a simple matter then to pick up his bearings again, and to bring his plane to rest after a 27 hour flight, 200,000 people relieved and joyous were there to welcome him.

Lindbergh had many wonderful receptions, but he was entranced by that welcome of our Latin neighbors. Will Rogers, who was in Mexico City at the time, says that whereas New York bombarded Lindbergh with ticker tape, Mexico City buried her streets two inches thick with flowers to welcome him; that instead of souvenir-hunting vandals tearing *The Spirit of St. Louis* apart, hundreds took it on their shoulders and bore it to the hangar.

No foreigner ever had anything like the reception Lindbergh had in Mexico City. They saw in him not merely the brave and gallant figure that fired their ardor, but the spirit of good will, the harbinger of a day of friendship between the two

republics whose relations have been a long series of misunderstandings. Canny Wall Street, that knows how to measure such things in terms of money value, dusted its Mexican bonds, and bought and sold them to higher values. Airplane stocks took a new spurt. Ambassador Morrow's own efforts towards better understanding received new life. The Ambassador of the Air had opened in American and Mexican hearts a new day of good will and friendliness and understanding.

How shall one write of the week that Lindbergh spent in Mexico City? As in many another place the people were crazed with enthusiasm. It was the same yet so entirely different. The President and Government and City did him honor and exchanged felicitations with the United States Government. Cheering throngs lined the streets wherever he went. Lindbergh, to whom travel has never lost its charm, was delighted. Here was something new. His mother flew to Mexico City to spend Christmas with him. As in Europe his first thought had been to call her on the telephone.

Even the outstanding events in that remarkable week are impossible to record. Shall one say that he was welcomed at the flying field by President Calles and forget that the first thing that was presented to him was a huge Mexican hat and an appropriate costume? May one record the fact

that the Mayor of Mexico City presented him with the keys of the city and not that the crowds milled around the Embassy, as in Paris, and shouted, "Come out, Lindy, we all want to see you," and a flurry of *"Viva's"* and "Long live the bravest of the brave" when he showed himself for a little while on the Ambassador's balcony? And how shall one write briefly of the days that followed when he paid an official visit to the President and other officials, of his visit to the schools, of the special solemn session of Congress; of the huge demonstration to him in the stadium; of his interest in ancient Aztec remains, of his fraternizing with Mexico's airmen; of his taking President Calles and Ex-President Obregon for their first rides in an airplane; of his receiving a cape from the noted Matador José Ordiz; of his delight in the floating gardens—Xochimilco—of Mexico, where they sang and played and heaped him with flowers as he glided in a punt through this southern Venice; of his visits to the mountains; of his delight in the dormant volcano Popocatepetl, 17,888 feet high, to be seen from the capital city almost unfailingly; of the Boy Scouts of Mexico who made him a member of their highest order; and most important of all, of the vision of the master aviator who, regarding everything in the light of his great interest, sees the day when the flying machine will

knit us with our neighbor republic in friendly intercourse; who sees air lines that will branch out of the high plains on which Mexico City stands (between 7,500 and 8,000 feet above sea level) and lengthen the link to the Central American republics.

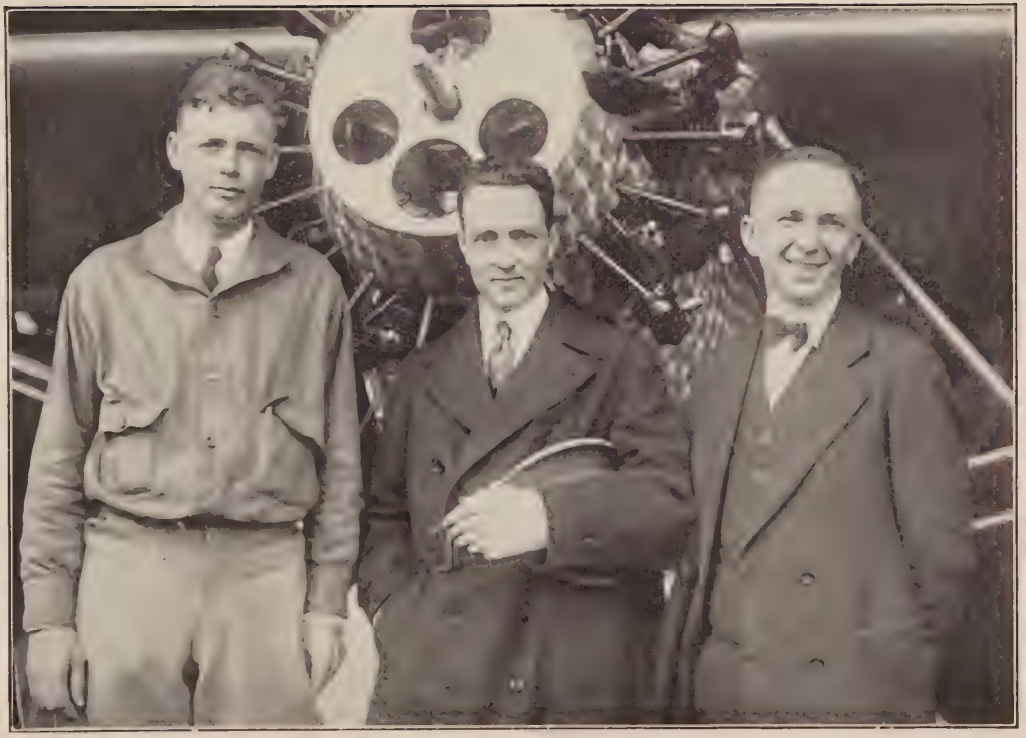
All these and more went to make the most significant contribution to the friendship between America and Mexico that has been known in the history of the two countries. Well might the New York Times editorially remark:

"Considering his world-wide and unsullied fame, together with his now heightened prestige, his country may be thought of, as it contemplates international distrusts and griefs, saying to him, as it was said to one of old: *'Who knoweth but thou art come to the Kingdom for such a time as this?'* "

New York, June 17th, 1927
Bryant Park Bank
Pay to the Order of Charles A. Lindbergh
Twenty-five Thousand No/100 Dollars
Payable in funds current at New York Clearing House
$25,000. No/100
Raymond Orteig

Wide World

The engraved check presented by Raymond Orteig to Col. Lindbergh.



International News Reel

America's famous trio of transatlantic fliers — Lindbergh, Byrd and Chamberlin.

CHAPTER TWENTY-ONE

THE CARIBBEAN TOUR

My plane . . . has gone safely over mountains where air lanes have never been flown.

LINDBERGH in the New York Times.

WHEN Lindbergh was thirteen he had visited Panama with his father. Could any imagination then have foreseen how he would come back on his second visit to the peoples of the Caribbean?

Lindbergh had been uncertain when he left Washington on the flight to Mexico City that his embassy of good will would extend any further, but it was inevitable that his own winsome and fabulous reputation would find hearts and hands beckoning him towards the south. That call was so insistent, and his own desire to see these countries and bring to them his message on aviation, was irresistible.

So the Caribbean Tour began on December 28th, 1927, with a jump of 675 miles from Mexico City to Guatemala, a swift flight under ideal conditions, completed in seven hours and five minutes.

From Guatemala his route took him to Belize, the capital of British Honduras, a distance of 250 miles. Then back again to the Pacific seaboard to San Salvador, the capital of the tiniest republic in Central America, a distance of 260 miles. To Tegucigalpa, the capital of the Republic of Honduras, was his shortest hop, 140 miles. Then on to Managua, the capital of Nicaragua, to San Jose, the capital of Costa Rica, and to Panama, flights of 150, 210 and 320 miles respectively. After a short vacation hunting in the Panama tablelands, the tour continued with flights to Cartagena and Bogota, the mountain capital of Colombia, to Caracas in Venezuela, and then the longest flight of this tour, a distance of 1,000 miles to the Virgin Islands over the chain of the Antilles, with some island in view nearly all the time. With stopovers at Porto Rico, Santo Domingo and Port Au Prince, the tour was brought to a conclusion with the flight to Havana, Cuba, where the Pan-American Congress was in session.

The flight from Mexico City to Havana, Cuba, with its many stops, covered in all a distance of a little over 5,300 miles—no great distance, as Lindbergh and *The Spirit of St. Louis* count distance. But in many respects it was Lindbergh's most romantic undertaking. During a very large part of this trip he was again the pathfinder of

the skies. He ran the risks that every pioneer must face, for a forced landing in the mountains might have meant disaster, but he had the fullest confidence in his plane and engine. He had refused to fly over the Gulf when a land route was available in his non-stop flight to Mexico City. It reveals an important angle to his character that while he is absolutely fearless of any risk if he considers the results to be obtained important enough, he yet will not attempt a foolhardy one.

It is of special interest in this tour that Lindbergh made careful plans to fall back on his Lone Scout training should disaster force him to make an emergency landing in the wild and unsettled country over which he flew. An axe to cut his way out of the bush, a fishing line and a rifle, in case he had to fall back on his own resources for food, the possibility of making a smoke that might be seen from the air through the trees,—the Lone Scout foundation of his training was peeping out at every point. But his carefulness in the preparations before every flight, and the trustworthiness of plane and engine, did not bring him anywhere near putting that training to the test.

The tour was also a constant delight to the Lone Scout, whose love of nature, its great mysteries and changing forms and its vast solitude, is a part of him. The mountains with its volcanoes; the

tropical vegetation, the gaily colored birds, kept him flying low whenever he could. He looked into the crater of an inactive volcano and saw trees growing within its cup—he saw an active one spit out sulphurous smoke a thousand feet below him. To him also the journey was romance.

How the Caribbean countries received our Ambassador of the Air it is impossible to even suggest here in an inadequate way. Guatemala City, the first to receive him, called him the "Celestial Envoy." Alvarado, one of Cortez's lieutenants, had come down from Mexico City many years agone, and where the Spanish had taken months, Lindbergh had been seven hours. The entire route was a range of mountains with hardly a landing place for a plane. Here, as elsewhere, on Lindbergh's tour, the people crowded the field on his landing, gave him every honor at their command, strewed their streets with roses. They not only gave him their hearts, but saw in his smile America's will to their friendship and gave theirs in return to us. No land plane had ever been in British Honduras before Lindbergh's came, and the polo ground improvised as a landing field provided Lindbergh with a problem both in landing and taking off. Honduras gave him a salute of 21 guns. Salvador, Costa Rica and the other republics made a public holiday of his coming. It was said that fighting in

Nicaragua ceased when he flew over it. Panama built a brand new air field and named it after Lindbergh. At each place there was something distinct in the honor they did him, as each flight and each visit provided Lindbergh with something new to see and experience.

The tour which had begun with the dramatic non-stop flight of 2,000 miles to Mexico City from Washington, ended after an equally thrilling non-stop flight of 1,200 miles from Havana, Cuba, to St. Louis, Lindbergh's home base. Storm, fog and rain covered nearly the entire route, and much concern was caused by the failure to sight *The Spirit of St. Louis* all day long. But the true homing instinct of the Lone Eagle again triumphed, the journey being completed after a battle with storm and wind lasting 15½ hours, Lindbergh landing at St. Louis on Feb. 13th at 5:01 p. m., just two months after he started out on his epoch making tour from Washington.

How may one follow this journey, with its romance of bridging air spaces which had never been flown, of colorful and romantic welcomes each different to the other, and above all convey an adequate impression of what it means in the friendliness that America has re-won through the personality of this slim young man, who a year ago was unknown? Air lines will surely follow his

trail. What it will mean in Pan-American friendship may have a significance that might change the destiny of the world. It is rapidly changing the attitude with which America regards these countries, and their attitude to the Colossus of the North, as the United States of America has been called in Latin America.

PART VII

HEROES ALL

CHAPTER TWENTY-TWO

AMERICA'S EAGLES

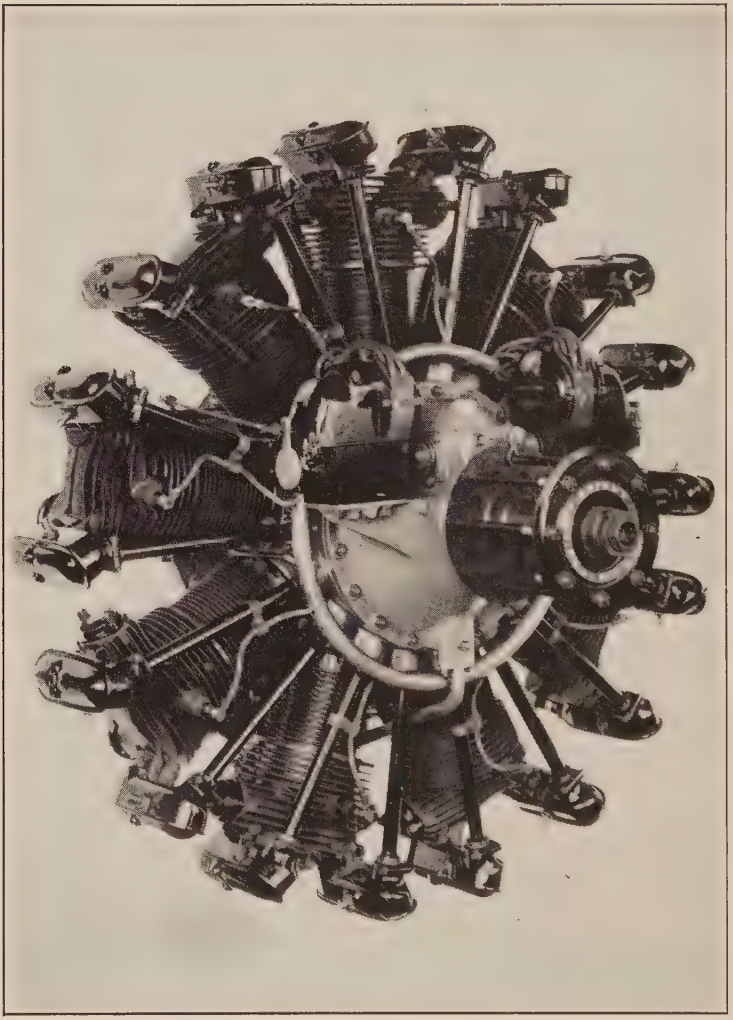
IT WOULD be no exaggeration to call the months that followed the famous New York to Paris flight, "the Lindbergh Era in Aviation." The cause of aviation, which Lindbergh had so close to his heart, received such an impetus as had not come to it even in the stimulus of war requirements.

As we suggested in the beginning, it seemed probable in the Spring of 1927 that something like a "race" would result for the honor of the first flight between New York and Paris. This must not be thought of in terms of jockeying for honors, as on a race course, for these were all serious undertakings, and the men responsible for them would not race in the commonplace vieing for first place that the word in its ordinary sense implies. Careful preparations were made in each case. The reputations of the men are such that while they would courageously face any hazard, foolhardy chances are unthinkable in connection with their names.

In the public mind the two American flights which followed *The Spirit of St. Louis* will be indelibly linked with Lindbergh's own achievement,

International News Reel

Lindbergh chumming-up with "Patsy" in the hangar at New York.



Wide World

The faithful Wright Whirlwind Motor.

not only for what they accomplished, but for the character of the men who took part, and the quality and equipment of the expeditions. Besides making their contribution to stimulating the interest in aviation that followed, Chamberlin following Lindbergh, and Byrd following Chamberlin, did more to gain Europe's respect for America's position in Aviation and the quality of her airmen, than anything that has happened since the Wrights showed the world how to fly at Kitty Hawk.

The first to take off after Lindbergh was the Bellanca monoplane *Columbia,* with Clarence D. Chamberlin. The *Columbia* has long been known as a wonder plane. It was built some years ago, and it has been flown in a number of air meets, winning prizes both for its load carrying capacity and speed. It is reported that Lindbergh tried twice to purchase this plane for his transatlantic flight, but the owners were reluctant to sell it for a one-man flight, feeling that failure would do the cause of aviation much damage. Its pilot, Clarence D. Chamberlin is one of America's great pilots. He is a graduate of the Iowa State University in electrical engineering. During the war he became a flying cadet, and on his graduation he was retained at Kelly Field as a test pilot. He has been flying ever since, and until quite recently held both the endurance and distance record with the *Columbia.*

For sometime prior to May 10th, the *Columbia* had been favorite for New York-Paris honors, but a disagreement arose between the plane's owner, and the navigator who had been chosen for the flight, and held the plane in its hangar when *The Spirit of St. Louis* took off.

The Columbia flight was planned for the morning of June 4th to an unannounced destination in Europe. Up to the last moment a mystery was preserved as to who would accompany Chamberlin on the flight. A moment before the chocks were removed from the plane, the owner, Charles Levine, climbed in beside Chamberlin. His going had been kept a secret even from his wife.

Because of the crowd of people along the runway, and a slight cross-wind which Chamberlin had to run into, he was forced to shut his engine down on the first attempt he made to take off. He brought the *Columbia* to a stop, turned it round on its own power and taxied it back to the starting point. His second run resulted in a perfect take-off. The plane left the ground with its tremendous load in 2,500 feet, and in a few seconds Chamberlin had all the elevation he wanted, and was heading up Long Island Sound.

Before they had covered a hundred miles, Chamberlin found that the Earth Inductor Compass

which had served Lindbergh so well was not operating, and his entire reliance had to be placed on his magnetic compass. What with straying from his course through the lack of accurate compass direction, and the head winds encountered over Rhode Island, the *Columbia* reached Cape Race two and a half hours behind its schedule. On this leg of the journey they had seriously considered abandoning the flight, but had determined to see it through. It was daring to undertake the Atlantic with nothing but a magnetic compass — for it is generally considered unreliable to within one degree of accuracy — and to this disadvantage was added the peril of a storm with snow and sleet. In his effort to avoid the worst of it, Chamberlin climbed the *Columbia* to a height of 17,000 feet, and finding that sleet formed at that height, had to bring his machine down quickly to the warmer air. Steering considerably south of the great circle course, as their weather maps advised, they avoided the worst of the storm area. The next morning, after a night of flying, they were uncertain whether they were heading for the coast of Ireland, France or Spain, when they sighted the Mauretania. Chamberlin circled the ship and read its name, found the date she had sailed from Southampton, and calculated the distance they were from Land's End in England.

When the Columbia circled the *Mauretania,*

Lindbergh was only twelve miles away on the *Memphis.* On receiving the Mauretania's wireless message of sighting the *Columbia* he hurried to the bridge to catch a glimpse of the plane, but the haze hid the plane.

Chamberlin steered for Land's End, but over England and the channel the weather was so bad that he was forced to fly at an altitude of 20,000 feet to get above the clouds. At 6 P. M. (New York time— 11 P. M. French) they came over Boulogne but the land was covered in a dense fog. The plane was headed in the direction of Berlin, but over Belgium and Holland the weather was so thick that they could not see any landmarks, or indeed identify any land.

They had been flying by dead reckoning, uncertain as to their position, when the dawn of their second day broke. Seeing some farmhands at work near a town, Chamberlin brought his plane down, cut the engine for a moment, and shouted to the men "To Berlin — To Berlin." They pointed their hands and nodded their heads, and he knew he was going in the right direction.

But in the meantime their gas had been running low, and a considerable amount of their reserve cruising range had been lost by detours, and the climbs the weather had forced on them. Seeing a field for a good landing, Chamberlin brought his

HIS SECOND GREAT FEAT

—Halladay in the Providence *Journal*.

Cincinnati Council,
Boy Scouts of America.
Fellow Scouts:

You Scouts of today are the fliers of tomorrow.

Your motto "Be Prepared" is the greatest factor in life. Your Merit Badge requirements covering as they do such important phases of aviation as the theory of the airplane, helicopter, ornithopter, spherical and dirigible balloons, types and makes of engines used, aviation and aerostation and the practice in model construction is the finest sort of preparedness for aviation.

I cannot be too enthusiastic in urging you Scouts and your non-Scout friends to make an intensive study of Merit Badge aviation.

Perhaps in cooperation with the local fliers you may be able to secure other very important information in actual flying operations.

With very best wishes to Scouts everywhere,

I am cordially yours,

(Signed) CHARLES A. LINDBERGH.
Colonel Charles A. Lindbergh.

plane down, fuel exhausted at Eisleben, Germany. A boy on a bicycle volunteered to get them some gasoline and as soon as this was brought, Chamberlin took the Columbia into the air again, but without an accurate compass to guide him he veered to the north east, and at 3:45 A. M. (New York Time) he was forced, with his fuel exhausted again, to make another landing. Seeing a field that looked ideal for the purpose he brought the *Columbia* down, but it turned out to be a bog, the wheels of the plane sank in the soft earth, and the plane pitched forward with no other damage than to the propeller. They had come down near a village called Kottbus, 110 miles east of Berlin. As computed by the U. S. Geological Survey, the Columbia had made a non-stop flight in a direct line of 3,905 miles, the world's record distance, after 43 hours in the air, as compared with a distance of 3,610 miles by Lindbergh in 33½ hours.

Thousands had been waiting until late into the night at Templehofer, Berlin's flying field, and had dispersed reluctantly. It was not until two days later with a new propeller, that the *Columbia* came to Berlin, to receive the greetings of a crowd of 150,000 people, and to be welcomed with the same enthusiasm and good-will that had greeted Lindbergh. Chamberlin and his passenger-owner later flew the plane to Vienna, Paris and London.

The following is a comparison between the *Columbia* and *The Spirit of St. Louis:*

	Columbia	*Spirit of St. Louis*
Span of wings	46 ft.	46 ft.
Wing area	272 sq. ft.	319 sq. ft.
Engine	Wright J 5-C	Wright J 5-C
Instruments	Identical Pioneer	Identical Pioneer
Weights—empty	1,850 lbs.	2,150 lbs.
Weight—load at take off	5,418 lbs.	5,150 lbs.
Length of body	33 ft.	34 ft.

The wings of the Bellanca plane are light brown, the fuselage grey. Both planes have steel propellers, and the fuselage is of equal sturdy construction. The cockpit of the *Columbia* is above the main gas tank, and gives an unobstructed view. The struts are a secret of the designer, and add to the lift of the plane. The wing of *The Spirit of St. Louis* is in one piece, whereas the Bellanca plane is in two pieces fastened to the fuselage.

The flight of the *America* differed in a great many respects from the two that had preceded it. These had been quick hops, with the minimum of equipment for safety and navigation. Commander Richard E. Byrd with his great record, his training and ability was qualified as few men living today to undertake an air voyage of exploration across the Atlantic, and indeed it is only such an

enterprise that could engage the foremost explorer-by-air of our day. His giant Fokker, with its triple engines, and crew of four, and his own scientific background made the expedition ideally qualified for the task of pioneering in commercial trans-atlantic aviation, and a study of the winds and currents of the air over the turbulent Western Ocean.

His flight had a unique appeal to boys, and especially to Scouts, for he has long been a boy's hero and a firm and interested friend of Scouting — besides one of a small group of men who are known as Honorary Scouts. His great interest in the Scout Movement led to his writing for BOYS' LIFE, the Scout Magazine, at considerable inconveniences and amidst the stress of receptions on his return from France, and plans for his Antarctic expedition, a story of his flight, which is here reproduced.

CHAPTER TWENTY-THREE

MY FLIGHT ACROSS THE ATLANTIC

By Commander Richard E. Byrd

When our preparations for the transatlantic flight were all made, we decided to wait until Colonel Lindbergh returned and to take part in the reception to him. I was glad that he was the first to fly from New York to Paris, for he succeeded in arousing an interest in aviation probably as no other flight could have done. After the reception, at the first report of fair-weather conditions, we took off. We were not waiting for ideal conditions.

The flight of the *America* was a scientific expedition. In every new endeavor information has to be added to information until this combined knowledge turns what once was a hazardous enterprise into a commonplace, everyday undertaking. In the matter of long transoceanic flights we are at the beginning. Alcock, Lindbergh, Chamberlin showed that the North Atlantic could be flown. The Wright Whirlwind motors in the *Spirit of St. Louis* and the *Columbia* showed that we had a

dependable engine capable of the tremendous strain. But it was still necessary to secure primary data regarding the air conditions, types of planes and accommodation, safety devices and other information—approximating as near as possible conditions under which such commercial flights would be undertaken—before long ocean voyages can become a regular service. In her construction and with her equipment, the *America* was ideally constituted to do such pioneering.

FACTORS OF SAFETY

The most careful consideration was, therefore, given to factors of safety, for these would be of prime importance in a commercial undertaking. The *America* was equipped with three engines, any two of which would have kept her in the air with a load of ten thousand pounds. We carried a collapsible rubber boat with oars, which we had tested for its seaworthiness. Our tanks were equipped with dump valves so that in case of forced landing in the sea we could have emptied them in a minute and being airtight, they would have buoyed the plane until we could pump up our rubber boat. We were equipped with a radio, both for sending and receiving, and it proved of the greatest utility. Although while flying across the ocean for nearly nineteen hours we saw neither land, sea, sky nor

ship, there was never a minute in that entire period when some station was not receiving our automatic signals. When it was impossible because of weather conditions to take any bearings, Lieutenant Noville's radio exchanges with two ships giving him their positions, enabled me by drawing two lines on my chart, from the direction of the ship in the direction of the plane to place our position, which would be exactly on the point at which the lines crossed.

THE TAKE-OFF

One of the greatest dangers of a flight with such a heavy load as the *America* carried is the take-off. Runways in which such ships can take off, built of concrete, are a necessary development for long-distance flying. I had examined every inch of the runway on Roosevelt Field, and had taken every precaution to guard against accident. To give the *America* a little added speed at the start, we built a little hill at the top of which the *America* had been moored, and when we took off in the early morning of June 29th, it helped us as much as seven or eight hundred added feet on the runway would have done. As it was, the mile of runway we had was not any too long, leaving a margin of safety. One of the improvements that will be made in airfields is the use of such inclines. They

Underwood & Underwood

The Ambassador of good will arrives in Mexico City

Photo by Underwood and Underwood

Colonel Lindbergh flying over the Mississippi River at St. Louis after his return from Havana.

could be placed on wheels and moved as may be required so that the pilot could take off into the wind. We were unable to take off one day, because of the danger of a cross wind. Such a wind could easily turn over a heavily loaded plane, resulting in a bad crash.

The *America* went into the air in forty-eight seconds, after a run of 3,268 feet. This was a remarkable accomplishment, for the plane weighed about 15,000 pounds We had 1,300 gallons of gasoline. Of course, we could have taken much more gas, if we had not taken the emergency equipment, mail, food and medical supplies, and cut our personnel down to two men. But, as I said, it was important that we provide for every emergency as the transatlantic commercial plane of the future would have to do.

THE FIRST DAY

It rained just before we took off at 5:24, and it was thick and drizzly until 8:30. One of the problems of aviation is keeping such a heavy load in the air, and for the first few hours we chose our altiture for safety rather than speed. After that the weather up until Newfoundland was clear, although there were some rough bits over Nova Scotia. We had an opportunity while on this lap to get data as to what altitudes it was best to fly

at to take advantage of the wind. Remember that a good following wind on a journey as long as this could add as much as 800 miles to the cruising radius of the plane, and that the factor of safety that our three engines gave us decreased our cruising radius because it is less compact and affords greater resistance than a one-engine plane.

We had three scares during that first day. Right near the start there was difficulty in making the plane lift, and we were afraid that it would be necessary for us to dump half of our gasoline and return. Actually Lieutenant Noville was all ready to dump one of the tanks when at the crucial moment the plane began to lift!

Our second scare was over Newfoundland. I noticed a big stream of oil floating aft on the deck. If it was due to a leak we would have been in a serious predicament. I recalled our North Pole experience and the miracle that saved us. I asked Noville, who was forward, to see what the cause was, and we were certainly glad to find that it was due to his spilling some oil when pouring it into the engines.

Some time after leaving Newfoundland, I asked Noville to check up the gas consumption. On the figures he gave me we were burning forty-two gallons of gas an hour. If we had kept on at that rate and with any winds against us, it would have

been impossible for us to reach the other side; especially if I did not succeed in picking up the northern side of the high pressure area from which I hoped to get a following wind. I did not tell the boys this, but I was worried. I chanced everything on our weather map. We began to climb for the tail wind that would prove the charts' value.

IN THE GRIP OF THE FOG

That climb took us above the fog and clouds, just in time to see the sun dip in a blaze of glory, into the western fog banks. Now began our long struggle through the entire night to get out of the fog. Hour after hour we were flying blindly by our instruments, and I couldn't help but admire the way in which Balchen and Acosta, who were relieving each other at the wheel, kept at their job. Our only contact with the world was the radio. Daylight, although we could not see the sun, was welcome. Sometimes the fog thickened so that we could hardly see the wing tips of the *America.* Occasionally the fog was so dense and wet that the water came dripping into our cabin. It was during this long period of fog that I checked up on the gas again, and found to my great relief that a mistake had been made and that we had enough for many hours' flying. The tilt of the plane had shown a wrong reading of the gasoline gauges. Actually

the consumption proved to be at the rate of about thirty gallons per hour for the entire flight.

Flying between these layers of fog we saw some wonderful and awe-inspiring sights. Sometimes we looked down hundreds of feet into dark ominous valleys. At times the horizon looked like a mountain range. Occasionally the effect was an illusion of blue lakes and rivers against the gray clouds.

Once or twice we found ice forming even on our engines and had to maneuver quickly out of this danger. We wondered what would have happened if the ice formed on our propellers.

Fog, rain, sleet for more than eighteen hours, but we were staking everything on our weather map in order to get the best following wind. This had led our course south of the route we had originally planned. Instead of steering for Ireland we aimed for Finisterre. We certainly were glad after hours of flying blind, to catch our sight of sea when nearing Brest, and to see the second sunset of our journey.

LOST OVER FRANCE

We now began to receive radio messages from all directions. It seemed as if every radio station in Europe was wanting to talk to us. Setting our course for Paris I checked very carefully for the points of land we should see. We had traveled for

more than 3,300 miles and there were only 300 left to the end of our journey. It began to rain, darkness fell, and while it became more and more difficult, and finally impossible to check on the lights of the cities beneath us, I was so confident that when we saw some bright lights ahead of us, at about the time we should have reached Paris, I got Noville to send a radio message to Mr. Rodman Wanamaker that Paris was in sight.

Imagine our astonishment to find when we reached the lights, that we were at some amusement resort on the water. Our compass had taken us in a circle instead of a straight line.

It was a crucial moment, for our gas was naturally getting low. I made a rapid calculation of our position and set another course to Paris. I checked the Earth Inductor Compass with the magnetic compass and found they agreed. It was quite evident that some magnetic attraction either on the ship itself or on the land had swung us around in a circle. We kept to this course until we thought we were over Paris, but the weather conditions, if anything, were worse, and we could see nothing underneath us. We were told that they had heard our engines at Le Bourget with a sound intensifier, but we saw no lights or anything else that would give us an indication of exactly where we were or that would make a landing possible.

If we kept on we would have been forced to make a landing in the darkness, should we miss Paris, and our only hope of safety was of making a forced landing on water. So we swung around back. It was our only course, if I was not to jeopardize the lives of the crew, as well as the lives of the people on the ground, if we made such a landing. I accordingly set our course to go back over the amusement resort, and coming out of the fog we saw it several times. We circled around it without finding a landing-place, hoping that its flashes would enable us to judge our distance when we came down. The light flashed too quickly, however, and proved useless for our purpose. I knew it was a perilous undertaking, for I had never heard of anybody landing on a pitch-dark night on water without a light.

THE LANDING

Balchen was at the wheel. For navigation purposes we had bombs which would ignite on striking water and give us a light for a few minutes. Our gas was almost exhausted.

We dropped a bomb and Balchen brought the plane down slowly, keeping up flying speed. He made what would have been, with pontoons, a good landing, but the land wheels striking the water

were wrenched off the fuselage, the plane tore through the water and stopped with a crash. The whole plane began to fill with water.

I was looking out of the window trying to judge out distance from the water. Noville says I was shot out of the window. I swam around and back to the window, shouting to Noville. But we had all been deafened by the roar of the engines! Noville was getting out of the window on the other side, and seeing he was safe I swam forward to the cockpit reaching for Balchen. I found him disentangling himself, rather stunned from the impact of the landing. I yelled for Acosta and looked for him in the cabin. I was afraid that he might be pinned under the fuselage. It was very dark and we swam around shouting for him. Presently Acosta, who also had been flung out of the plane, appeared, and I certainly was glad to see him.

Our emergency compartment on top of the plane had been placed there so that in the case of forced landing the top of it would remain clear of the water. Our calculations again proved accurate. Noville tore off the top, we got out the rubber boat, got on top of the wings, and pumped air into it. We were stiff and bruised, and this was rather a strain. The main tank, empty of gasoline, was buoying us up. Embarking on the boat we rowed ashore, car-

ried it up the beach and set out for the nearest light of the village of Ver-sur-mer, which was some distance away.

THE VALUE OF THE FLIGHT

Because of the adverse conditions under which the flight of the *America* was made, we were able to demonstrate the practicability of transoceanic flights in a much more convincing way than if everything had been plain sailing. For one thing, the voyage of the *America* proved that an airplane could stand up against anything but the worst storms. The *America,* designed by Mr. Anthony Fokker, will, I think, in all essential respects prove the forerunner of the transatlantic plane of the future. Our three Wright Whirlwind motors, each of two hundred and twenty-five horse-power, beat flawlessly the entire forty-two hours. The radio proved that such equipment is absolutely essential to the safety of the regular transatlantic airplane when it does come.

The difficult weather conditions did also give us data, which otherwise would not have been possible, on how to combat bad weather conditions. Because of the speed of the airplane the drift is of the utmost importance when such a long journey is contemplated. If a navigator is not able to check

his wind drift for a long period, he might find himself at the end of the journey four or five hundred miles off his course. The flight of the *America* in eighteen hours of fog proved a plane's position could, in such circumstances, be constantly checked by finding our bearings through the position of the ships received over the radio.

We found that the strength of the winds increased up to 1,500 feet and did not increase much after that until an altitude of 3,000 feet had been reached. Thereafter the strength of the wind seemed to increase with the altitude. We also found on several occasions that, when the surface winds were from an easterly direction, by climbing 6,000 feet or so we could get a following wind.

The wind in the storm areas of the north Atlantic travel counter-clockwise around the storm center when going from west to east. Flying on the southern side of this disturbance the navigator is helped by the wind, especially if he flies at a good altitude. In the high-pressure or good-weather areas the wind moves clockwise in the north Atlantic and by traveling on the north side considerable assistance could be gained from the winds.

Data such as these are absolutely necessary to the commercial flier of tomorrow. Even storms will be made to shorten the distance he has to fly.

OUR MESSAGE OF GOOD-WILL

One of the chief hopes in which the expedition of the *America* was undertaken was that the flight would serve to foster the good-will between France and America which has existed for so many years. We carried a piece of bunting from which was made the original Betsy Ross flag, to present to the President of France, and in other ways we hoped to further cement the traditional friendship which has existed between these two countries. In this respect too, we were eminently successful, for the French people received us with a sincere cordiality, and showered upon us many kindnesses that betoken the friendship and esteem in which they hold the American people. I was glad that among the expressions of American good-will that I was able to convey to the French people was one of greetings from the Boy Scouts of America to the Boy Scouts of France. They are fine fellows, and it gave me a great deal of satisfaction to do this as one of the eighteen Honorary Scouts of the Boy Scouts of America.

As I said at the beginning, we hoped to be among those pioneers whose efforts would make trans-oceanic flying a commercial possibility. I think it is possible that that day will be here in five or ten years when great planes, twice as large as the

America, with multiple engines—sixty per cent of which would keep it in the air—will begin to ply across the Atlantic. Possibly in fifteen or twenty years travel in them will be as common as travel on steamships is today. When that day comes the new liners of the air will be in the hands of the Scouts of today, and whatever satisfaction I feel in the flight of the *America* is overwhelmed in the thought that experiences, such as the flight of the *America,* enable us to deliver into your hands that greater day for which you endeavor through Scouting to "Be Prepared."

CHAPTER TWENTY-FOUR

IF I WERE A SCOUT

By Clarence D. Chamberlin

IF I WERE a Scout . . . well, I am a Scout. I have always been with them in spirit, but the other day at the Interstate Park camps, New York made me one of her scouts, and I am proud of the honor.

But if I were a boy again and a Scout, as indeed I would be — (there were no Scout Troops at Dennison, Ia., when I was a kid) — and if at the same time I wanted to make flying my job when I grew up, how would I make the Scout program help me towards my ambition?

First of all, I would try to be a good Scout, and I would advance in my tests to First Class rank. The things that Scouting develops — the resourcefulness, the quick thinking, the ability to look after oneself anywhere — the being prepared for any old thing that came along — that is necessary for success in anything, and aviation needs them as much if not more than any other profession. And you must have a background, an attitude towards

life such as the Scout Oath and Law gives you to amount to anything in any walk of life. During the war they used to say that the one arm of the service that preserved the old idea of gallantry and of courtesy to foe was the air service, and the records of the armies of all the nations are full of splendid gestures of chivalry from one airman to another. Those are necessities of life that the program of Scouting would lay up for me, without conscious effort, and you may be sure I would take full advantage of it.

Now let me see. In the tests themselves what particular help would I be getting that would serve me when I became an airman. First, those *Tenderfoot knots.* Again and again an airman, especially flying cross country, and having to come down in all kinds of fields, has found the ability to tie a good knot and moor his plane in a wind, mighty useful. *First Aid* — knowledge of how to take care of fainting, shocks, bruises, cuts and scratches, burns, to dress wounds — the more advanced stuff as a First Class Scout—that would certainly be real preparation for emergencies as an airman. *Signaling.* A good airman learns that anyway, and if you went to the army training school as I did, you would be required to learn it as a part of the exacting course. Learning *the Compass* would be a direct training for the air, as would be *map read-*

ing and *judging distances*. You see I would be getting real preparation for the air even while I was qualifying as a Second and First Class Scout.

And don't forget the pure Scout stuff — scout pace, cooking without utensils, tracking, swimming, hiking, use of knife and axe, observation and knowledge of trees and birds. They would be building my body for endurance; my eye for quick observation and my brain for correct deduction and judgment; my resourcefulness. These the good airman must have. And the thrift requirements — well you know few of us airmen are millionaires, and to learn to save your pennies and spend them carefully would certainly be no handicap to you as aviators.

And then the Merit Badges. I would have my eye on the Eagle Scout badge, of course, but there are some within its twenty-one badge requirements, and some out of it, that I would go in for hard — wanting as I do to be an airman, a good airman — one of the best, for that would be, of course, my ambition, as I hope it will be yours if you decide to go into flying.

Well, let me see. Lets begin at the A's. *Automobiling* of course. I made my own merit badge program in that as a boy when I became interested in a motor cycle. And I have tinkered around with engines, mostly airplane engines, ever since. There are

several of them in my work shop now — or rather were, for I sold them a few days ago. *Blacksmithing?* Mighty useful. In that too I took a course of my own. *Carpentry,* the knowledge of a carpenter's tools, would be a fine thing for the practical airman to have, especially if he is jaunting cross-country, in an old plane. New, high-powered planes are expensive, and not every beginner can afford them. *Electricity, radio,* advanced *signaling.* I don't need to tell you, who have been reading about long flights across wide continents and great oceans, how useful such knowledge would be. With them behind you, you would have a head start on anybody taking up flying without the training or its equivalent.

You notice, of course, that I purposely avoided one of the Merit Badges. No need to tell you, I would go after the Merit Badge on *Aviation* with everything I had. With the other things I have mentioned it would just about set me up and get me ready for the business of actual flying. Let me see again how those requirements run:

1. Have a knowledge of the theory of the aeroplane, helicopter, and ornithopter, and of the spherical and dirigible balloon.

Well, I would not only want to get that, but to keep up with it.

2. Make a working model of any type of heavier than air machine that will fly at least twenty-five yards; and build a box kite that will fly.

Important theories of flying were first tested with models, and somewhere back of all our great airmen you will find the kite-flying craze. The Wright Brothers who taught the world to fly as kids were the expert kite fliers among their companions, and model making has shown the way to many important developments in flying.

3. Have a knowledge of the types and makes of engines used for aeroplanes, the best known makes of aeroplanes, and feats performed or records made by famous aviators.

There are many well known fliers who do not know very much about engines—there were many daring pilots during the war who wrote their names in history who did not know so much about the motive power of their planes. They were, most of them, trained quickly for a particular job in the air. But the real airman, who learns to love his ship, and flying for their own sake, wants to know everything he can about engines, of all makes and types of ships, and what makes their difference and value. What others have done is, I need not say, a constant inspiration and spur to an airman's own efforts.

4. Have a knowledge of names of famous airships (dirigibles) and some of their records.

The heavier than air machine is very much in the public eye at the present time, but airships have demonstrated their value. They are an important branch of flying, and but for their costliness would be put to much greater use than they are at present.

5. Understand the difference between aviation and aero-station, and know the types of apparatus which come under these two heads.

The art of flying depends on its science, and the science in turn is helped by the art. These are important branches working to one end.

In the next five years more than five million boys will come into touch with the Scout program. What couldn't they do if only a small part of them were inspired to become airmen and get the preliminary training such as the Scout program provides, what a great future will be in store for America in the air!

CHAPTER TWENTY-FIVE

A FLYING MODEL OF THE *Spirit of St. Louis*

By Elmer L. Allen

This plan is for a 36 in. Model Airplane. The measurements which are printed on various parts of the plan are the actual dimensions for a Model of that size. When making other measurements on the plan, multiply by four, as the reproduction of the plan is one-fourth actual size. This plan is fully protected by copyright, and permission is granted for use only for amateur purposes.

MANY airplane builders and aviators agree that the next best thing to building and flying real airplanes is the building and flying of models of real planes. Accurate models, made to duplicate in miniature the large machines they represent, and having to a great extent the same constructional features, provide the finest possible opportunities for experiment and study. And when they can be made to fly in the air their value is greatly increased. They not only instruct in the principles of aeronautics, but also provide pleasure and entertainment in their construction and flight.

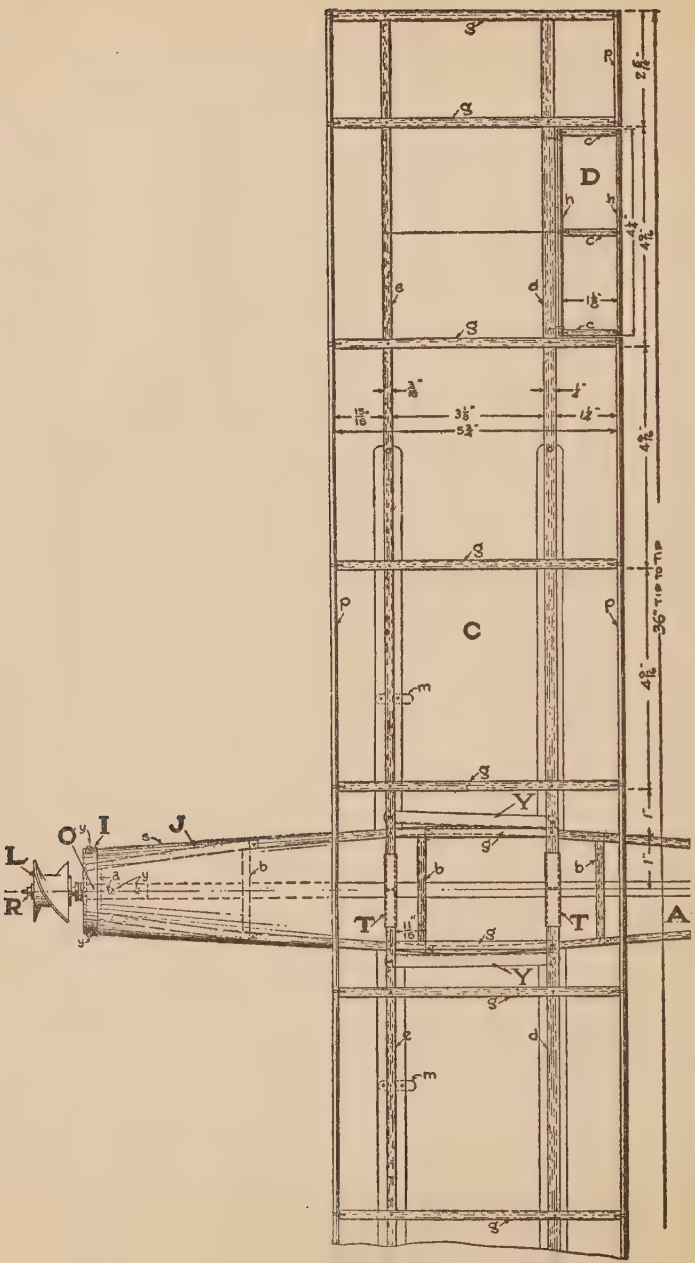
The first requirement of a good model airplane is an accurate plan. This plan of the *Spirit of St. Louis* is known as a "scale-reduction" plan; that is,

it is the actual plan of the large machine, scaled down to model size. It is therefore, true and accurate in every detail. A key to parts and material is also included with the plan, the lettered indications corresponding with the letters on the various views.

The list of materials required to build the *Spirit of St. Louis* is as follows:

Wood—	1	piece,	5/16 in. square, 21 in. long
	5	"	5/32 in. square, 24 in. long
	1	"	1/8 in. square, 24 in. long
	2	"	1/8 in. x 1/4 in., 20 in. long
	2	"	3/16 in. x 1/4 in., 20 in. long
	1	"	5/32 in. x 3/8 in., 6 in. long
	10	"	1/16 in. x 3/16 in., 12 in. long
	5	"	3/32 in. diameter, 10 in. long
	1	"	1/16 in. diameter, 6 in. long
	1	"	3/16 in. x 3/4 in., 5 in. long
Reed—	1	"	3/32 in. diameter, 36 in. long
	2	"	1/8 in. diameter, 36 in. long
	2	"	3/16 in. diameter, 6 in. long

Sheet Aluminum, No. 34 gauge; 2 pieces, 6 in. x 12 in.
Sheet Aluminum, No. 34 gauge; 1 piece, 6 in. x 6 in.
One large Spool Tinned Wire.
Nine Small Corks: 1/2 in. long x 3/8 in. diameter.
Wood Propeller, 10 in. size; Carved or Blank.
Rubber Strands for Motive Power.
One Pair 2 in. Wheels.
Bamboo Paper for Covering: 1 sheet, 24 in. x 33 in.
Bamboo Varnish: One Can. Wood Glue: One Can.
Small Screws: 1/4 in. 3 dozen. 3/8 in. 1/2 dozen.



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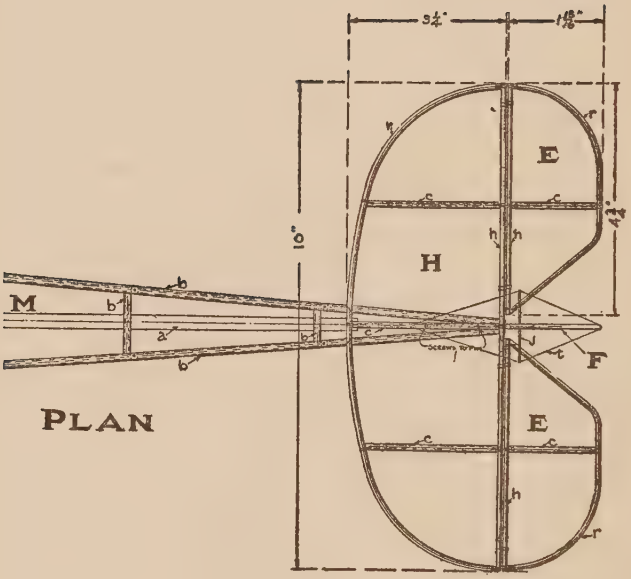
J
36" TIP TO TIP

Small Nails, 1/2 in. long.
Piano Wire for forming Propeller Hook, Shaft, etc.
Small Tools: Drills, Screw Driver, etc.

Study the plan carefully before starting actual work. Figure out where each size of wood is to go; where reed is used and how the various parts of aluminum and wire are to be formed into shape. Build the fuselage first. Arrange nails in a flat board the exact shape that the four long pieces of wood (5-32 in. square), which form the frame of the fuselage, must be shaped. Put these pieces in a flat pan and cover them with water. Let them boil for at least twenty minutes. Take the pieces from the water and immediately place them in the form made with the nails on the board. Bend them carefully so they do not split. Leave them there until thoroughly dry.

When dry, arrange them in position and tack the vertical cross-pieces in position as shown on the plan. Make the two sides separately; then put them together, using the horizontal cross-pieces. Drill 1-32 in. holes through the long pieces (they are called longerons) in the proper places; use ½ in. nails and reinforce the joint with plenty of glue. Be careful to get both the vertical and horizontal cross-pieces in proper position as indicated on the plan. Next place the tail-skid in position, using wire and glue.


M
H
E
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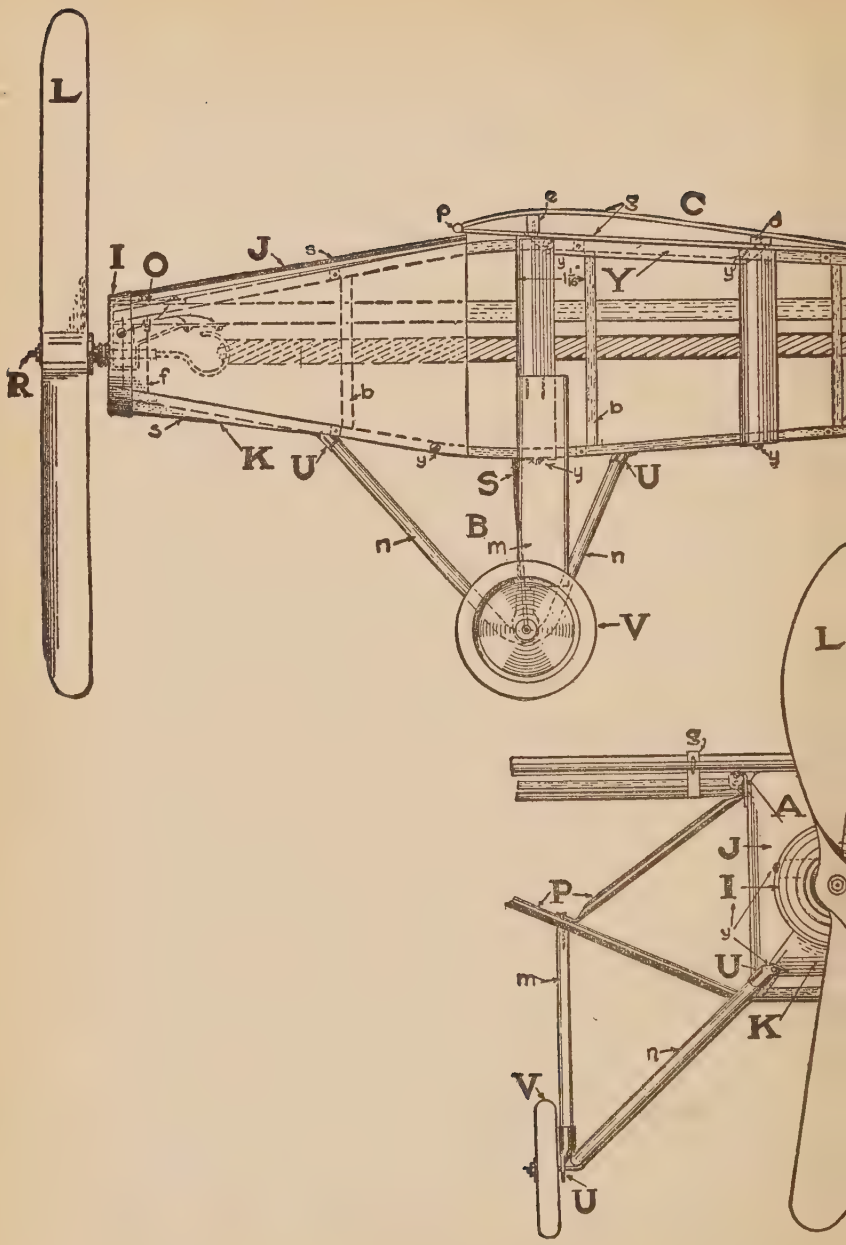
F
10"
PLAN

Now put in the motor stick, indicated as "M" on the side elevation plan. This is the 5/16 in. square piece of wood. Cut it off carefully to the length required. Form the propeller hanger from a strip of aluminum cut from the large sheet, drill holes as required and attach in place on the end of the motor stick. Drill a 1/16 in. hole about ½ in. from the rear end of the motor stick and fasten the rear rubber hook as shown. Make this hook from a short piece of piano wire. Also make the propeller shaft from this wire, shaped as indicated, and insert it through the holes drilled in the propeller hanger. The rubber strands are simply hooked over each of these hooks on the propeller shaft and the motor stick. Be sure the motor stick is securely fastened into place; this must bear the whole strain of the motor when the model is in flight.

Now cover the whole fuselage with bamboo paper, excepting the front panels on the top, bottom and two sides, and the next-to-last panel on the under-side at the rear end; the panel immediately under the rear rubber hook. Cut the paper roughly to size. Apply glue to the fuselage, not on the paper, and work the paper over the fuselage so it is smooth all over and as tight as possible without tearing it. When the paper is on, trim it to within an eighth inch of the frame; then apply glue a little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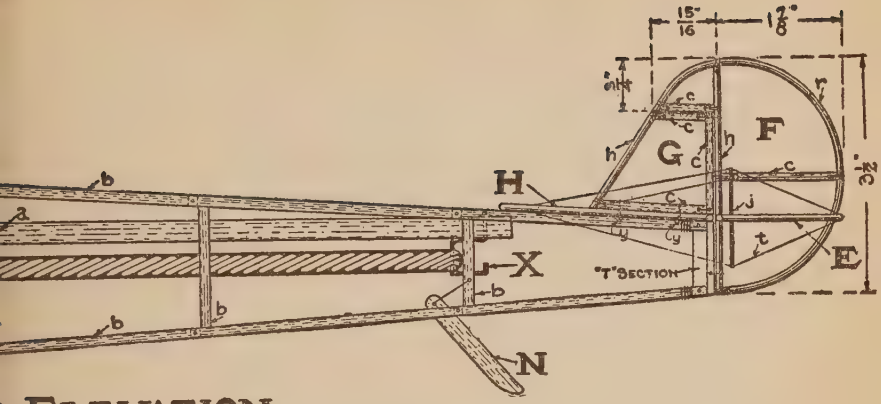
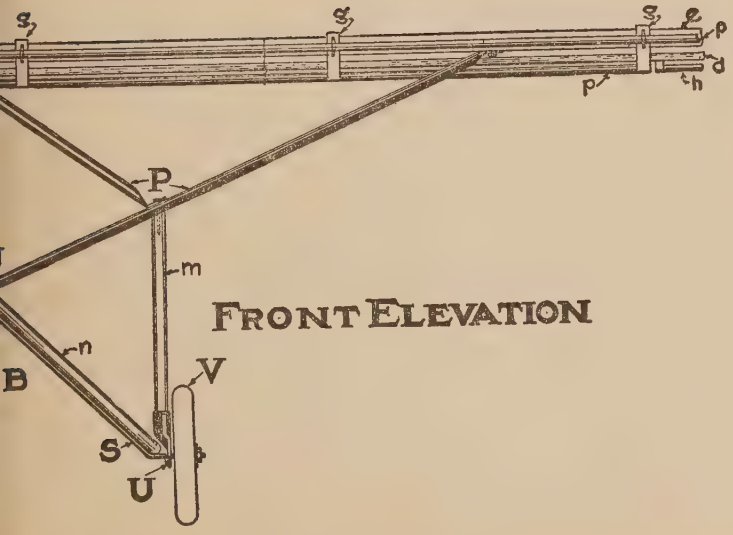


ELEVATION



FRONT ELEVATION

at a time on the end of the finger and work these edges down smooth. Arrange the paper so the rough edges come on the under-side of the model. Coat the paper with bamboo varnish. Put it on smooth all over. It will loosen and wrinkle the paper at first, but when dry will shrink it tight. To hold the fuselage in correct shape, place weights on the sides and leave it until the glue and paper are thoroughly dry.

Cut and shape the top and bottom cowling from the sheet of aluminum. Drill 1/16 in. holes for attaching to forward end of fuselage. Place the lower cowling first, and fasten it into position. Then place the upper, or larger cowling, and fasten it securely. Make two plane holders (see "Y" on plan) and attach them to the fuselage at exactly the same position on each side. One edge will be flat against the side of the fuselage and the other will extend outward at right angles. The main plane will be fastened to these extending edges.

The frame for the main plane is made in two halves. These halves are joined and fastened with spar sleeves before the front and rear edges of the plane are attached. Select the proper wood; cut it to size, including the long pieces for spars. The main plane must be made one-half right and one-half left; this is important; watch the plan. The two

pieces of wood 3/16 in. x ¼ in., each 20 in. long, are for the front spar. Cut them the exact size in length according to the plan. The two pieces ⅛ in. x ¼ in., each 20 in. long are for the rear spar. Cut them also the exact length. Select one piece of each size and lay them together perfectly even and straight, ends even. Now mark them accurately to indicate exactly where each rib is to go. Note that the front spar stands on edge, while the rear spar lies flat. Mark them carefully, measuring out the distance between each rib. Then attach the ribs according to the marks. The lower ribs must be straight; the under side of the plane is perfectly straight and flat. The upper, or top, ribs are curved. The 1/16 in. x 3/16 in. wood used for these ribs will curve naturally into shape as the ribs are fastened together at the ends, but care must be taken to see that the lower ribs do not also curve. Tack the ribs in place with very small nails.

Make both halves of the main plane, putting ribs in place on each half, then join the halves together with spar sleeves made from aluminum. Fasten the sleeves around the spars with small nails. See that the spars are perfectly straight and true. Drill 1/32 in. holes in the ends of all ribs, through both top and bottom pieces. Then attach the 36 in. long pieces of ⅛ in. reed at each edge. The ailerons (see "D" on plan) must be arranged in the

ends of the plane as shown. Build these into the plane before attaching the reed. Then attach the reed in a continuous piece from end to end. After it is in place and securely fastened the movable ailerons can be completed by cutting through the reed at the places indicated. Next cover the under-side of the plane with bamboo paper, using glue as with the fuselage covering. Then cover the top-side the same way. Coat the paper with bamboo varnish and set the plane aside to dry. Prevent warping by laying light weights on the plane until it dries.

Next make the landing gear. Boil and bend the 3/16 in. reed into shape as indicated at "n" on the side-elevation view. Two pieces are required, both exactly alike in shape and length. Attach these to the fuselage by means of small nails or screws in exactly the position indicated on the plan. Make an axle of strong wire bent into shape indicated at "S" on the front-elevation view, and attach to the under-side of fuselage and to the bottom of the curve in the reed supports. The plane struts, "P" on the front-elevation view, must be made by folding strips of aluminum into proper size and shape and flattening the ends for about ½ in. The part indicated by "m" on the front and side-elevation views, must be made from the piece of 3/16 in. x ¾ in. wood. Cut it to shape and

size and round the edges. Make two pieces, both exactly the same.

Now make the stabilizer, elevators, rudder and fin. Use wood and reed in sizes as marked on the plan, wiring the pieces together in the shapes and sizes indicated. Make each separately, cover with bamboo paper and bamboo varnish as described previously. Drill 1/16 in. holes where necessary in the ailerons, elevators and rudder to accommodate the wood levers which operate these parts. Push small, round pieces of wood through the holes so they project evenly on each side. Parts of round toothpicks are excellent for his purpose.

Now comes the assembling. Hinge the elevators to the stabilizer with fine wire. Drill two 1/16 in. holes through the center rib of the stabilizer and screw the fin ("G") on the side-elevation view to the top-side of the stabilizer. See that the rear ends of both are even. Next wire the completed tail unit to the top of the fuselage, as shown. Brace the fin by running wire from the top of the fin to one outer rib of the stabilizer, underneath to the bottom of the fuselage, up again to the other outer rib on the other side, and then back again to the top of the fin. Drill 1/16 in. holes through which to run the wire. Pull the wire tight to brace the parts and wind the ends together. Then hinge the rudder to

the rear end of the fuselage near the bottom and to the upper part of the fin. Drill holes in the fuselage and the fin, but pierce the paper covering of the rudder so the wire will pass around the reed frame-work. Attach the elevators the same way using fine wire.

Now lay the main plane flat on the table, bottom-side up. Turn the fuselage upside-down and lay it on the main plane. Place the plane absolutely square with the fuselage and exactly even on each side; the plane must extend equal distance on each side of the fuselage. If it is in proper position, the aluminum plane holders, mentioned previously, will come in line with the center of the spars on each side of the fuselage. Mark the holes and then drill 1/32 in. holes for screws to hold the plane to the fuselage. Be sure this operation is tight and secure, otherwise the model will come apart in flight.

Attach the plane struts in place, fastening the flattened ends to the under-side of the plane and the lower edge of the fuselage. Keep the main plane perfectly level. Place the short center struts in position, one end against the center of the longer struts, and the other against the top edge of the fuselage. Place the two wood parts, the shock-absorbers, in position with the top ends against the

long struts and the lower ends against the reed landing gear braces. Use nails at the top and wire at the bottom. Attach the propeller, bending over the end of the wire on the outside and forcing it into the wood to hold the assembly rigid. Mount the wheels so they turn easily and turn back the ends of the wire to hold the wheels in place. Drill a strip of aluminum with nine 1/32 in. holes equally spaced. Place a small screw through each hole and screw on each one of the small corks, large end against the aluminum. Screw them up tight. Bend the aluminum around into a circle, to form a ring, and fit it over the nose of the fuselage immediately behind the propeller. Fit it tightly and fasten in position with the corks sticking straight out all around. With black ink, color the corks a solid black. These represent the cylinders of the famous Wright Whirlwind motor.

Now the model is completed. Before flying test it carefully. Put in on a smooth runway and push it gently away from you. See if it runs straight and true. Correct any sideways motion. Then see that the rudders, ailerons, elevators and fin are straight. To wind it up, hold it firmly at the fuselage with the left hand and wind the propeller from left to right with the forefinger of the right hand. See that the rubber is not twisted at the start

of winding. Count the revolutions of the propeller. Do not wind more than fifty times at the start. Face the direction from which the wind is blowing, hold the propeller with the fingers of the right hand, life the tail skid off the ground with the left hand. Then give the model a slight push forward and release it quickly. It will not rise much, if at all, but should run along the ground in a straight line and perfect level. If it doesn't, adjust it until it does. Then wind the propeller about 100 times and try a short trial flight. If everything seems proper, wind the propeller 150 turns and let the model take-off as explained. Then it should run along the ground for a few feet and rise into the air for a flight of from 75 to 100 feet.

The plans reproduced here are reduced to 1/4 size, but can be used by taking careful measurements and enlarging the parts accordingly. Larger plans of the *Spirit of St. Louis,* one-half actual size of a 36-inch model and giving all details of construction, may be obtained by writing to Elmer L. Allen, 15 East 26th Street, New York City, and enclosing twenty-five cents for each plan desired. There are also several manufacturers of model airplane supplies, parts and materials who can furnish any materials required by the model builder, and who also supply all the parts required

for the *Spirit of St. Louis,* all arranged in sets so all the model builder need do is assemble the model.

Key to Parts and Materials as noted in the Diagrams

A—*Fuselage* . . . . . *a—Wood* . . *5/16" x 5/16"*
B—*Landing Gear* . . . . . *b—* " . . *5/32" x 5/32"*
C—*Main Plane* . . . . . *c—* " . . *1/8" x 1/8"*
D—*Aileron* . . . . . *d—* " . . *1/8" x 1/4"*
E—*Elevator* . . . . . *e—* " . . *3/16" x 1/4"*
F—*Rudder* . . . . . *f—* " . . *5/32" x 3/8"*
G—*Fin* . . . . . *g—* " . . *1/16" x 3/16"*
H—*Stabilizer* . . . . . *h—* " . . *3/32" diameter*
I—*Nosing* . . . . . *j—* " . . *1/16"* "
J—*Upper Cowling* . . . . . *m—* " . . *3/16" x 3/4"*
K—*Lower Cowling* . . . . . *n—Reed* . . *3/16" diameter*
L—*Propeller* . . . . . *p—* " . . *1/8"* "
M—*Motor Stick* . . . . . *r—* " . . *3/32"* "
N—*Tail Skid* . . . . . .
O—*Propeller Hanger* . . . . . *s—Sheet Aluminum, No. 34 gauge*
P—*Plane Struts* . . . . . *t—Tinned Wire, No. 34 gauge*
R—*Propeller Shaft* . . . . . *y—Screws*
S—*Landing Gear Axle* . . . .
T—*Spar Sleeve* . . . . . .
U—*Terminal Fitting* . . . . . .
V—*Running-Gear Wheels* . .
X—*Rear Rubber Hook* . . . .
Y—*Plane Holder* . . . . . .

PART VIII

LINDBERGH AND THE BOY SCOUTS

"Tell the Boy Scouts I am with them."

LINDBERGH.

CHAPTER TWENTY-SIX

WELCOME HOME

THAT swift flight by which Lindbergh made his jump between New York and Paris, and its sheer romance, carried for no one so sure an appeal as it did to the four million men and boys who have called themselves Boy Scouts of America. Here were dreams of pioneering, of romance, of high adventure come true in one sublime moment. Engine and human typified scout aspiration, and Lindbergh himself, with his careful preparation, his confidence and daring, appealed to them with certain hero worship. And what boy is there who had not dreamed some day of flying?

Swift words went immediately winging their way to Lindbergh and his mother with Scout greetings. To Paris went this cable:

"The congratulations of eight hundred and forty thousand Scouts on your achievement so splendidly typifying the spirit of American Youth." At the same time his mother in Detroit was reading the message from the Chief Scout Executive:

"Eight hundred forty thousand Scouts join me

in congratulations on your son's daring and epoch-making flight. To no one will this adventure mean so much as to the Boy Scouts of America in whose hearts your son is already enshrined as a hero."

Within half an hour of the wheels of *"The Spirit of St. Louis"* touching the ground at Le Bourget, a Scout, representing his fellow Scouts of Detroit, was standing before Mrs. Lindbergh's door with a huge basket of flowers and a message of congratulations.

Two public tributes from Scouting were made to Lindbergh a few days after his landing in France. On Monday, May 23rd, in an interview which the United Press broadcast in its wide service, the Chief Scout Executive paid tribute to the character of the flier and his accomplishment. Col. Theodore Roosevelt, a member of the Executive Board of the National Council, whose friendship Lindbergh had sought while in New York, wrote for BOYS' LIFE, then going to press with its July issue, a story of the flight, calling Lindbergh "The Pathfinder of the Skies." "There are those who have called him 'The Flying Fool,' " said Col. Roosevelt. "It is a gross misnomer. He is a trained and skillful aviator, who knows his business as well as any man alive."

It was only with the home coming of their hero that Scouts were able to show their full appreciation—to pour out all the hero worship that had

been welling in their hearts. At Washington 2,000 Scouts lined the route along which Lindbergh passed, not merely to shout their greetings to the sky, but to help the police in holding the thousands of eager spectators in line. To them had fallen a sort of post of honor—that part of the line which had no barriers. Such is the good nature with which the public look upon Scouts that they had no difficulty in holding the enthusiastic spectators in orderly line, although a few minutes earlier the "hard-boiled" Marines at the barriers of the Navy Yard had been swept before the crowd eager to see "Lindy" at close quarters. The Eagle Scouts of Washington were given a special assignment. To them fell the privilege of acting as ushers at the reception platform that had been erected at the Washington Monument. From Washington Lindbergh sent his first message to Scouts: "Tell the Boy Scouts, I am with them!"

Lindbergh came to New York June 13th. Ten thousand Scouts volunteered their service to the city, and it is typical of Scouts that these boys sacrificed their eagerness to join the crowds and cheer their own hero for the opportunity of helping on streets away from the parade, for every available policeman had been called on to hold the line of eager millions who began to assemble with the first streak of dawn.

The arrival of the Lone Eagle in New York coincided with a meeting of the Executive Board of the National Council. At the annual meeting of the latter body, held only a month previous, there had been created a new class of membership—Honorary Scouts. To it were eligible only "American citizens whose achievement in outdoor activity, exploration and worthwhile adventure are of such an exceptional character as to capture the imagination and stimulate their enthusiasm for the outdoor program of the Boy Scouts of America." Eighteen men, known the world over for their exploits, had been appointed Honorary Scouts:

ROY CHAPMAN ANDREWS,
CAPTAIN BOB BARTLETT,
FREDERICK R. BURNHAM,
RICHARD E. BYRD,
GEORGE K. CHERRY,
JAMES L. CLARK,
MERION COOPER,
LINCOLN ELLSWORTH,
LOUIS FUERTES,
GEORGE BIRD GRINNELL,
DONALD McMILLAN,
CLIFFORD H. POPE,
GEORGE PALMER PUTNAM,
KERMIT ROOSEVELT

KARL RUNGIUS,
STEWART EDWARD WHITE,
ORVILLE WRIGHT.

By special action of the Executive Board, Col. Lindbergh's name was added to this list. The following letter was addressed to him notifying him that he had been made an Honorary Scout:

June 13, 1927.

Colonel Charles A. Lindbergh,
c/o Mr. Clarence H. Mackay,
Roslyn, L. I.

Dear Colonel Lindbergh:

It is with great pleasure that the Boy Scouts of America, through a meeting of its National Executive Board, held today at the University Club, have unanimously elected you as an Honorary Scout.

This designation is restricted to American citizens whose achievement in outdoor activity, exploration and worthwhile adventure are of such an exceptional character as to capture the imagination of boys and stimulate their enthusiasm.

Your splendid record of courage and confidence, based upon thorough preparation, and the qualities of character you have since manifested, so thoroughly harmonize with what we desire to have set before the boyhood of America as an ideal, that we are greatly pleased to confer upon you this honor.

We are confident that the three and a half million boys who have been Scouts in the last seventeen years, and the 856,000 who are now Scouts and Scout officials,

will all be inspired by the splendid qualities of manhood which you have revealed.

On behalf of the Boy Scouts of America, we are

Sincerely and cordially yours,

[Signed] WALTER W. HEAD,
President.

[Signed] JAMES E. WEST,
Chief Scout Executive.

To Eagle Scout James Campbell, of Floral Park, Long Island, fell the privilege of taking this message to Col. Lindbergh, who was being entertained that evening at the home of Clarence H. Mackay, at Roslyn, Long Island. Lindbergh had had a strenuous day—a public breakfast at Washington, the flight to New York, and the slow hours of parade, over water, and five miles amidst cheering multitudes on New York's streets. He had excused himself from the reporters who had asked for an interview as he was too tired. Yet when this message was brought to him by Scout Campbell, and Remo M. Lombardi of the National Staff, also an Eagle Scout, who accompanied him, Lindbergh left the gay throng assembled to do him honor, and took the Scouts on the lawn for a quiet chat. "I am certainly glad to know I am an Honorary Scout," he told them.

He also told them that he had been asked several times if he had been a Scout, and of how, when he was fourteen years of age, while in Washington

he had been all ready with his Tenderfoot tests, and had made arrangements to join a troop when the family moved. He never had the opportunity again to carry out this ambition.

While in New York, during Lindbergh's visits to Brooklyn and Mineola, Scouts of these districts had their share in the parades and receptions to him. Brooklyn Council, in addition to having almost its entire membership along the long route of the Lindbergh welcome parade, provided a special guard of six Eagle Scouts at the reception platform. Mineola, besides having the honor of providing the Scout who carried the National Executive Board's letter to Lindbergh, took part in the ceremonies at Roosevelt Field where the famous flight began, and which lies in that Council's territory. They provided a special color guard at the reception platform.

The torrent of Scout enthusiasm found its climax when "Slim" came home to St. Louis. Here Scouting was to play a part all its own in the main welcome to the flier, who embodied and whose plane was called "The Spirit of St. Louis." Many boys, in the true Scout spirit, took assignments with the Red Cross and other services in connection with the reception.

A selected group of 240 Scouts was appointed as a special guard of honor and the space around the

grandstand was filled with Scouts. As the parade approached the stands the escort veered into two lines and Lindbergh passed between them.

Three uniformed members of Troop 2, the oldest Scout troop in the city, stepped from the grandstand to Lindbergh's automobile while the color guard took a position behind them.

Murray Cabell, Jr., leader of the Flying Eagle Patrol, presented Lindbergh with a certificate of membership in Troop 2.

"I certainly do appreciate being a member of your troop," Lindbergh told him.

Roland Homer, Jr., handed him the red felt insignia of the patrol cut in the shape of an eagle on the wing.

"Thank you," said Lindbergh.

Joseph Erhardt then presented the famous flier with an official Scout knife, inscribed to "Scout Lindy."

"I hope you don't cut yourself with it," Erhardt said. "I certainly hope so," replied Lindbergh, "and thank you very much."

Lindbergh smiled gravely and shook hands with the three Scouts.

Meanwhile Scout George Lagenburg was presenting the flier's mother with a huge bouquet of roses in the next machine. Scout Bronson Corbett then presented her with the letter from the National

Executive Board notifying Lindbergh that he had been made an Honorary Scout, with a copy of BOYS' LIFE, which the flier had asked be sent on to him.

Mrs. Lindbergh took a rose from her bouquet and presented it to Scout Corbett, who promised that it would be saved in the Troop's archives.

CHAPTER TWENTY-SEVEN

HELLO LINDY!

WHEN Lindbergh took up the tour of the country, under the auspices of the Guggenheim Foundation for the Promotion of Aviation, Scout contacts with him became numerous, and a detailed account of them all would fill a book. The following is a brief record taken from some of the reports received:

BOSTON, MASS.

Scouts were massed in front of the State House and as Colonel Lindbergh mounted the steps, three Scouts and two color bearers stepped forward and Charles McDowell, presented him with a Scout statuette. Scout Executive Donald C. North welcomed Col. Lindbergh on behalf of the 2,000 Scouts present.

CONCORD, N. H.

The Scouts of Concord manned the Red Cross tent, and assisted the officials and the police in the reception to Col. Lindbergh. Two Scouts were assigned as special orderlies to the flying hero and

one of them, Scout Kanter, was entrusted with a huge bouquet of flowers presented to the Lone Eagle for delivery at a hospital. At the banquet that evening the check room arrangements were handled with great efficiency by the Scouts.

BUFFALO, N. Y.

Fifteen hundred Scouts and 99 leaders took part in the Lindbergh reception at Buffalo, every one of them correctly uniformed. They were placed every fifteen feet along the curb, the full length of the parade. Immediately after the last automobile in the parade had passed, the Scouts from the sides closed in, marching forty abreast from curb to curb. This continuously growing trail of Scouts gave the parade a splendid effect.

WHEELING, W. VA.

Uniformed Scouts of Wheeling, West Virginia, took charge of the entire handling of the crowd at the landing field, manned fourteen first aid stations and did all the ushering at the State Fair Grounds in the reception to Col. Lindbergh.

DAYTON, OHIO

Not only did nearly every Scout of Dayton turn out to welcome Col. Lindbergh but Mr. Perle L. Whitehead, the Scout Executive, as a member of

Dayton's official reception committee, had the honor of welcoming him on behalf of the youth of the city.

CINCINNATI, OHIO

One hundred picked Scouts formed Col. Lindbergh's bodyguard at Redland Field, meeting him at the gate and escorting him to the grandstand. Two hundred more were stationed at the stand. Scouts also erected and manned the first aid station. The feature of Cincinnati's Scouts' welcome to Col. Lindbergh was the initiation of the Lone Eagle as a member of the Ku-ni-eh, an Honorary Scout society of Cincinnati. As a part of the ceremonies, Col. Lindbergh was presented with a Ku-ni-eh war bonnet. Col. Lindbergh in a letter addressed to the Cincinnati Council also expressed his interest in the Aviation Merit Badge as a means of developing interest in aviation among Scouts. This letter is reproduced elsewhere.

LOUISVILLE, KY.

Louisville's entire Scout membership turned out to the reception to Col. Lindbergh and lined the path the flier took from the hangar to the speakers' stand. The Scouts also rendered very useful service in connection with the police and Red Cross arrangements.

DETROIT, MICH.

Thirteen hundred Scouts assisted the police in handling the crowd of 70,000 that greeted Lindbergh on his arrival at Detroit. Fifteen minutes before the Lone Eagle arrived all the Scouts, except those located at various parts of the field with stretchers, were taken from their assignments and lined up on both sides of the roadway leading to the speakers' stand. They formed a solid line, shoulder to shoulder, for over two hundred yards. An Eagle Scout acted as Col. Lindbergh's honor escort.

GRAND RAPIDS, MICH.

About 200 Scouts acted as special aides to the police, forming a lane through which Col. Lindbergh started on the parade. About 400 Scouts were used at John Ball Park to control the crowd. At the Lindbergh banquet the Sea Scout Orchestra furnished the music and an honor Eagle Scout was seated at the speakers' table with the Lone Eagle. Forty uniformed Scouts acted as table guides, ushers and messengers, and three uniformed leaders acted as door guides.

CHICAGO, ILL.

Chicago's contribution to the Lindbergh reception was 100 Scout messengers at the flying field when

the Lone Eagle landed and an escort of 32 Eagle Scouts at the Stadium. These Scouts stayed with Col. Lindbergh until the evening, escorting him to the banquet and back again to his hotel. There was a special reserve section at the Stadium for about 750 Scouts. On this occasion a feature of the reception was the presentation by Col. Lindbergh of 1924 Jamboree Medals to Eagle Scouts Harold Vollman and John Manz, of Chicago, Edward Leland of Oak Park, and Ken Williams, of Kenosha, Wisconsin. The Chicago Council had a special table at the Lindbergh banquet and four Honor Scouts during the evening presented a Scout statuette to Col. Lindbergh. This was the only outside organization to whom such a courtesy was extended.

Since the above was written the Lindbergh tour under the auspices of the Guggenheim Foundation for the promotion of aviation has been completed. The Lone Eagle has added to his enviable record an air journey of 22,350 miles with 260 flying hours. Only once did he fail to keep his schedule—when fog prevented his making a landing at Portland, Maine, in the early part of the tour. He wanted to be sure of a safe home for his beloved partner *The Spirit of St. Louis,* otherwise he could have made a landing on the outskirts of that city.

Scout acquaintance awaited Lindbergh at each

point of the eighty-two cities of the forty-eight states he visited, and his own interest in the Boy Scouts grew as the tour progressed. At nearly every place he visited, Scouts had a prominent part in the receptions, and the occasion was used by many Scout Councils to give Scouts qualifying the thrill of receiving their Eagle Badges and other Scout honors from the hands of the distinguished Honorary Scout. Another development as the tour progressed was the practice of Scout Councils, fortunate enough to receive Lindbergh, inviting neighboring Councils to send delegations to share with them the honors in the parade, thus assuring an even wider Scout acquaintance for Lindbergh. It is safe to say that there are few men living who have become acquainted with as many Scouts as Lindbergh did in the three months of this tour.

We wish it were possible for us to give here a detailed account of the part played by Scouts in the receptions at fifty towns that Lindbergh visited after Chicago, but such a task would be impossible in the confines of this book. We do, however, take occasion to add to this record a quotation from an interview Lindbergh granted to Dick Rockoff of the Boy Scout Press Association of Los Angeles. Here is the story in Scout Rockoff's own words:

"To the representatives of the metropolitan press and news associations, Col. Lindbergh confined

his remarks chiefly to discussion of the heavy toll of life taken by recent attempts to span the Atlantic to Europe and the Pacific to Hawaii, to propaganda for more airports, local flying conditions and prophesies of the future. He was already sliding from the table on which he sat, ready to hurry to a 'tea' given by luminaries of the motion-picture colony, when I interjected the question:

" 'Colonel, do you think that Scouting can further the interests of aviation in this country?'

"There was a show of immediate enthusiasm—calm and unruffled, but nevertheless enthusiasm—as he turned and saw my uniform and that of Scout Billy Webb, assistant editor of the press association. His eyes fastened on our reporter's badges.

" 'Surely,' he said, 'and I wish I had unlimited time to discuss this with you.

" 'The present young members of the Boy Scouts of America are not only going to distinguish themselves as flyers but there are other angles to aviation in which they can, and will, play a major part. There is the manufacturing side—the making of craft and the perfection of safety mechanism and the working out of finer scientific instruments. Then there is the co-ordination of the radio with the Science of flying. Airport progress is a great field and in this, too, Boy Scouts will certainly

have a hand. Some of the greatest heroes of aviation will never leave the ground.

" 'Take this matter of the Scout Oath and Law. It means a generation of youth of clean habits, clear thinking, freedom from fear, and thoroughly fitted by mental, physical and spiritual training for both commercial and pioneer air work. Those Scouts who are already interested in aviation will do well to take up very seriously the merit badge in this subject, for it will give them a handicap over those who do not have this preliminary understanding of aircraft and instruments.' "

CHAPTER TWENTY-EIGHT

THE SCOUT OF SCOUTS

ALL THIS enthusiasm of Scouts for Lindbergh and Lindbergh for the Scouts must be read not only in the light of the great feat which made him famous, but in the spirit in which he has accepted his fame, and the spirit that brought him to it. In his own life he has lived the Scout Laws—Trustworthy, Loyal, Helpful, Friendly, Courteous, Kind, Obedient, Cheerful, Thrifty, Brave, Clean, Reverent—as few have done; indeed many of these shine with a new brilliance for the meaning he has given them.

Before Parmalee Herrick's home in Cleveland two hundred Scouts had come up to greet Colonel Lindbergh. They had hiked six miles from camp to see Lindy for a few minutes, and after it was over they would hike back six more. They lined up, about ten deep before the Lone Eagle, and one of them stepped up and called for the "Lindy yell" that they had specially prepared for the occasion. It was one of those yells that took your hands and feet, as well as your voice, and speeded up the

tempo as it went along, to finish at a crescendo with "Lindy! Lindy!" It was one of those slightly mad things that says what you want to say much better than you can in words, and it rang over the carefully manicured lawns with the enthusiasm that only two hundred boys can give it.

There were some introductions and handshakings, after which Mr. John K. Doan, the Scout Executive, asked Colonel Lindbergh's permission to repeat the Scout Oath in unison in parting. This was something different, deep voices of the leaders, and the treble of boys, standing at Scout Sign, repeated:

On my honor I will do my best—
To do my duty to God and my country and obey the Scout Law;
To help other people at all times;
To keep myself physically strong, mentally awake, and morally straight.

Lindbergh had never taken that Promise, but it seemed then that this slim young man, leaning over slightly and looking down earnestly at those boys, was the embodiment of the Scout Oath, that he was the finest illustration that had ever stood before the Boy Scouts of America, of one who fulfilled its promise and kept himself physically strong, mentally awake and morally straight.

THE SCOUT LAW

1. **A scout is trustworthy.**

A scout's honor is to be trusted. If he were to violate his honor by telling a lie, or by cheating, or by not doing exactly a given task, when trusted on his honor, he may be directed to hand over his scout badge.

2. **A scout is loyal.**

He is loyal to all to whom loyalty is due; his scout leader, his home, and parents and country.

3. **A scout is helpful.**

He must be prepared at any time to save life, help injured persons, and share the home duties. He must *do at least one good turn to somebody every day.*

4. **A scout is friendly.**

He is a friend to all and a brother to every other scout.

5. **A scout is courteous.**

He is polite to all, especially to women, children, old people, and the weak and helpless. *He must not take pay for being helpful or courteous.*

6. **A scout is kind.**

He is a friend to anifals. He will not kill nor hurt any living creature needlessly, but will strive to save and protect all harmless life.

7. **A scout is obedient.**

He obeys his parents, scoutmaster, patrol leader, and all other duly constituted authorities.

8. **A scout is cheerful.**

He smiles whenever he can. His obedience to orders is prompt and cheery. He never shirks nor grumbles at hardships.

9. **A scout is thrifty.**

He does not wantonly destroy property. He works faithfully, wastes nothing, and makes the best use of his opportunities. He saves his money so that he may pay his own way, be generous to those in need, and helpful to worthy objects. *He may work for pay, but must not receive tips for courtesies or good turns.*

10. **A scout is brave.**

He has the courage to face danger in spite of fear, and to stand up for the right against the coaxings of friends or the jeers or threats of enemies, and defeat does not down him.

11. **A scout is clean.**

He keeps clean in body and thought, stands for clean speech, clean sport, clean habits, and travels with a clean crowd.

12. **A scout is reverent.**

He is reverent toward God. He is faithful in his religious duties, and respects the convictions of others in matters of custom and religion.

GLOSSARY OF TERMS USED IN AERONAUTICS*

Aerodynamics—The branch of dynamics which treats of the motion of air and of the forces acting on an airplane in motion relative to the air.

Aeronautics—The science and art pertaining to the flight of aircraft.

Aerostat—A term for aircraft whose support is chiefly due to buoyancy derived from gas lighter than air. The immersed body consists of one or more bags filled with a gas which is lighter than air. A balloon or airship.

Aerostatics—Science relative to air and gases not in motion.

Aerostation—The art of operating balloons as contrasted with *aviation.*

Aileron—A hinged movable surface of an airplane, usually part of the trailing edge of a wing, the primary function of which is lateral control.

Air Controls—The mechanism to operate the ailerons, elevators and rudders of aircraft.

Aircraft—Any weight-carrying device or structure designed to be supported by the air, either by buoyancy or by dynamic action.

Airdrome—A regular flying field, equipped for service of aviators.

Airfoil—Any surface designed to be projected through the air in order to produce a useful dynamic reaction. An airplane wing.

Airfoil Section (or profile)—A cross section of an airplane wing.

*From Merit Badge Pamphlet on Aviation, published by the Boy Scouts of America.

Airplane—A mechanically driven aircraft, heavier than air, fitted with fixed wings, and supported by the dynamic action of the air.

Airplane Pusher—An airplane with the propeller or propellers in the rear of the main supporting surfaces.

Airplane, Tandem—An airplane with two or more sets of wings of substantially the same area (not including the tail unit) placed one in front of the other and on about the same level.

Airplane, Tractor—An airplane with the propeller or propellers forward of the main supporting surfaces.

Airport—A locality, either of water or land, which is adapted for the landing and taking off of aircraft and which provides facilities for shelter, supply, and repair of aircraft; or a place used regularly for receiving or discharging passengers or cargo by air.

Airship—An aerostat provided with a propelling system and with means of controlling the direction of motion. When its power plant is not operating, it acts like a free balloon.

Nonrigid—An airship whose form is maintained by the internal pressure in the gas bags and ballonets.

Rigid—An airship whose form is maintained by a rigid structure.

Air Speed—The speed of an aircraft relative to the air.

Air-speed Meter:

Air-speed Indicator—An instrument for indicating the speed of an aircraft relative to the air.

Airway—An air route between air traffic centers which is over terrain best suited for emergency landings, with landing fields at intervals equipped with aids

to air navigation. The term "airway" may apply to an air route for either landplanes or seaplanes or both.

Altimeter—An instrument for measuring or indicating the altitude of an aircraft.

Amphibian—An airplane designed to rise from and alight on either land or water.

Anchor, Sea—An open fabric bag carried on an aircraft and arranged to offer considerable resistance when towed mouth-first through the water.

Anemometer—An instrument for indicating or measuring the speed of an air stream.

Angle, Aileron—The angular displacement of an aileron from its neutral position. It is positive when the trailing edge of the aileron is below the neutral position.

Angle, Elevator—The angular displacement of the elevator from its neutral position. It is positive when the trailing edge of the elevator is below the neutral position.

Angle, Minimum Gliding—The acute angle between the horizontal path along which an airplane can descend steadily in still air when the propeller is giving no thrust.

Angle of Attack—The acute angle between the chord of an airfoil and its direction of motion relative to the air.

Angle of Stabilizer Setting—The acute angle between the line of thrust of an airplane and the chord of the stabilizer.

Angle of Wing Setting—The acute angle between the plane of wing chord and the line of thrust.

Angle, Propeller-blade—The acute angle between the chord of a propeller section and a plane perpendicu-

lar to the axis of rotation of the propeller. Usually called "blade angle."

Angle, Wing-dihedral or Dihedral—The acute angle between the transverse reference line in the wing surface and the lateral axis of the airplane projected on a plane perpendicular to the longitudinal axis. The dihedral angle is positive when the upper obtuse angle for the two wings is less than 160 degrees.

Aspect Ratio—The ratio of span to mean chord of an airfoil.

Aviation—The art of operating heavier-than-air craft.

Ballast—Any substance, usually sand or water, carried in a balloon or airship and intended to be thrown out, if necessary, for the purpose of reducing the load carried and thus altering the aerostatic relations.

Ballonet—A compartment of variable volume constructed of fabric, or partitioned off, within the interior of a balloon or airship.

Balloon—An aerostat without a propelling system.

Free—A balloon, usually spherical, whose ascent and descent may be controlled by use of ballast or with a loss of the contained gas, and whose direction of flight is determined by the wind.

Bank—To incline an airplane laterally, i. e., to rotate it about its longitudinal axis. *Right-bank* is to incline the airplane with the right wing down. Also used as a noun to describe the position of an airplane when its lateral axis is inclined to the horizontal.

Barograph—An instrument for recording the barometric or static pressure of the atmosphere.

Basket—The structure suspended beneath a balloon, for carrying passengers, ballast, etc.

Biplane—An airplane with two main supporting surfaces placed one above the other.

Body—The fuselage or hull of an airplane or seaplane.

Buoyancy—The upward air force on an aerostat which is derived from aerostatic conditions. It is equal to the weight of the air displaced.

Camber—The rise in the curve of an airfoil section from its chord. *"Upper camber"* refers to the upper surface of an airfoil and *"lower camber"* to the lower surface; *"mean camber"* is the mean of these two.

Ceiling:

Absolute—The maximum height above sea level at which a given airplane would be able to maintain horizontal flight, assuming standard air conditions.

Service—The height above sea level, assuming standard air conditions, at which a given airplane ceases to be able to rise 100 feet per minute.

Center of Pressure of an Airfoil Section—The point in the chord of an airfoil section, which is at the intersection of the chord and the line of action of the resultant air force.

Chord (of an airfoil section)—The line of a straight edge brought into contact with the lower surface of the section at two points.

Cockpit—The open spaces in which the pilot and passengers are accommodated. When the cockpit is completely housed it is called a cabin.

Controls—A general term applied to the means provided to enable the pilot to control the speed, direction of flight, attitude, and power of an aircraft.

Controls, Air—The means employed to operate the control surfaces of the aircraft, i. e., aileron controls, elevator control, rudder control.

Controls, Engine—The means employed to control the power output of the engines, i. e., throttle control, spark control.

Control Stick—The vertical lever by means of which the longitudinal and lateral controls of an airplane are operated. Pitching is controlled by a fore-and-aft movement of the stick, rolling by a side-to-side movement.

Displacement—Load or displacement, sometimes used to mean total difference in weight between maximum volume and pressure and total weight of hydrogen or gas principally used to displace it. Often also expressed in maximum cubic feet of gas capacity.

Dirigible—That which can be directed; steerable; as a dirigible balloon. Its popular use as a noun to indicate an airship is improper.

Dive—A steep descent, with or without power, in which the air speed is greater than the maximum speed in horizontal flight.

Dope, (Airplane)—The liquid material applied to the cloth surfaces of airplanes to increase strength, to produce tautness by shrinking, and to act as a filler for maintaining air tightness; cellulose nitrate.

Dope, (Pigmented)—An aircraft dope to which a pigment has been added to make an opaque finish, or to protect it from the effects of sunlight.

Drag—The component parallel to the relative wind of the total air force on an aircraft or airfoil.

Drift—The lateral velocity of an aircraft due to air currents.

Duralumin—An alloy of aluminum which is much used in aeronautics, especially for the structure of airships and airplanes.

Elevator—A movable auxiliary airfoil, the function of which is to impress a pitching movement on the aircraft. The elevator is usually hinged to the stabilizer.

Endurance—Time or distance covered without refueling.

Engine, Inverted—An engine having its cylinders below the crankshaft.

Engine, Radial—An engine having stationary cylinders arranged radially around a common crankshaft.

Engine, Rotary—An engine having revolving cylinders arranged radially around a common fixed crankshaft.

Engine, Vertical—An engine having its cylinders arranged vertically above the crankshaft.

Engine, V-type—An engine having its cylinders arranged in two rows, forming, in the end view, the letter "V."

Fin—A fixed surface, attached to a part of the aircraft, parallel to the longitudinal axis, in order to secure stability; for example, tail fin, skid fin, etc. Fins are sometimes adjustable.

Fire Wall—A fire-resistance transverse bulkhead, so set as to isolate the engine compartment from the other parts of the structure and thus to reduce the risk from fire in the engine compartment.

Flight, Cross-Country—A flight which necessitates leaving the vicinity of a regular landing field.

Float—A completely inclosed water-tight structure attached to an aircraft in order to give it buoyancy and stability when in contact with the surface of the water.

Flying Boat—A form of seaplane supported by a hull when resting on the surface of the water. For the central hull type, lateral stability is provided by wing-tip floats.

Fuselage—The structure, of approximately streamline form, to which are attached the wings and tail unit of an airplane. In general it contains the power plant, passengers, cargo, etc.

Gap—The distance between the planes of the chords of any two adjacent wings, measured along a line perpendicular to the chord of the upper wing at any designed point of its leading edge.

Glide—A descent with reference to the air at a normal angle of attack and without engine power sufficient for level flight in still air, the propeller thrust being replaced by a component of gravity along the line of flight. Also used as a verb.

Glider—A form of aircraft similar to an airplane, but without a power plant.

Hangar—A shelter for housing aircraft.

Helicopter—A form of aircraft whose sole support in the air is derived directly from the vertical component of the thrust produced by rotating airfoils.

Hangar—Aircraft shed.

Hydroaeroplane—Airplane capable of alighting from or traveling upon water.

Inclinometer—An instrument for indicating the attitude of an aircraft. Inclinometers are termed fore-and-after, lateral, or universal, according as they indicate inclination.

Indicator, Turn—An instrument for indicating the existence of an angular velocity of turn of an aircraft about the normal axis. In horizontal flight it indicates the presence of a yawing velocity.

Kite—An aircraft heavier than air, restrained by a towline and sustained by the relative wind.

Landing Field—A field of such a size and nature as to

permit of aircraft landing and taking off in safety. An Airdrome. It may or may not be part of an airport.

Landing Gear—The understructure which supports the weight of an aircraft when in contact with the surface of the land or water and reduces the shock on landing. There are five common types—boat type, float type, skid type, wheel type, and ski type. (Amphibian may be a combination of the float or boat type with wheels or skis.)

Landplane—An airplane designed to rise from and alight on the land.

Leading Edge—The foremost edge of an airfoil or propeller blade.

Leveling Brackets—Brackets attached to the side of the fuselage for rigging purposes, on which is placed a spirit level to put the airplane in flying position. The brackets are parallel to the thrust line.

Load:

Dead—The weight of an airplane less the useful load.

Full—The sum of the dead load and the useful load. Also called "gross weight."

Pay—That part of the useful load from which revenue is derived, viz., passengers and freight.

Useful—The weight of the crew and passengers, oil, and fuel.

Longeron—A fore-and-aft structural member of an airplane fuselage.

Monoplane—An airplane which has but one main supporting surface, sometimes divided into two parts by the fuselage.

Multiplane—An airplane with two or more main supporting surfaces placed one above another.

Nose-Heavy—The condition of an airplane in normal flight when the distribution of forces is such that, if the longitudinal controls were released, the nose would drop.

Ornithopter—A form of aircraft heavier than air, deriving its chief support and propelling force from flapping wings, as in flight of birds.

Over-All-Length—The distance from the extreme front to the extreme rear of an aircraft, including the propeller and the tail unit.

Pancake, To—To level off an airplane at a greater altitude than normal in a landing, thus causing it to stall and to descend on a steeply inclined path with the wings at a very large angle of attack and without appreciable bank.

Panel (wing parts)—Where a wing surface comprises several units of construction, these units are designated as panels.

Pilot—An operator of aircraft. This term is applied regardless of the sex of the operator.

Pitch of a Propeller:

Effective—The distance which an aircraft advances along its flight path for one revolution of the propeller.

Pitot Tube—A cylindrical tube with an open end which is pointed into the line of flight; this apparatus is connected to the air-speed meter with two small tubes. (See Venturi tube.)

Plywood—A product formed by gluing together two or more layers of wood. The alternate plies are usually placed with grain at right angles to the adjacent plies.

Propeller—An air screw. A device used in converting

the energy of a motor into the energy required for the propulsion of an aircraft.

Propeller Thrust—The force parallel to the propeller axis of the total air force on the propeller.

Propeller Torque—The force giving an airplane a tendency to rotate in a direction opposite to that in which the propeller is turning due to the action of the propeller on the air.

Pyeon—Pole or tower placed on flying field to mark course.

Quadruplane—An airplane with four main supporting surfaces, placed one above another.

Rigger—One who is employed in assembling and aligning aircraft.

Rigging, (airplane)—The assembling, adjusting, and aligning of the parts of an airplane.

Roll—A maneuver in which a complete revolution about the longitudinal axis is made, the horizontal direction of flight being approximately maintained.

Rudder—A movable auxiliary airfoil, the function of which is to impress a yawing moment on the aircraft in normal flight.

Rudder Bar—The foot bar by means of which the control cables leading to the rudder are operated.

Seaplane—Any airplane designed to rise from and alight on the water. This general term applies to both boat and float types, though the boat type is usually designated as a "flying boat."

Side Slipping—Flight in which the lateral axis is inclined and the airplane has a component of velocity in the direction of the lower end of the lateral axis. When it occurs in connection with a turn, it is the opposite of skidding.

Skid—A runner used as a member of the landing gear and designed to aid the aircraft in landing or taxying.

Tail Skid—A skid used to support the tail when in contact with the ground.

Skidding—Sliding sidewise away from the center of curvature when turning. It is usually caused by banking insufficiently, and is the opposite of side slipping.

Sky Writing—The act of emitting from an aircraft a trail of smoke or other visible substance, the flight of the aircraft being so directed as to cause the trail to assume the form of letters or symbols.

Slip Stream—The stream of air driven by the propeller.

Soar—To perform sustained free flight without self-propulsion; it is called "up current soaring" if performed in ascending air; "dynamic soaring" in other cases.

Span (airplane)—The maximum distance measured parallel to the lateral axis from tip to tip of an airplane inclusive of ailerons.

Speed, Landing—The minimum speed at which an airplane can maintain itself in level flight and still be under adequate control.

Spin—A maneuver consisting of a combination of roll and yaw, with the longitudinal axis of the airplane inclined steeply downward. The airplane descends in a helix of large pitch and very small radius, the upper side of the airplane being on the inside of the helix, and the angle of attack on the inner wing being maintained at an extremely large value.

Spiral—A maneuver in which an airplane descends in a helix of small pitch and large radius, the angle of attack being within the normal range of flight angles.

Stability—That property of a body which causes it, when disturbed from a condition of equilibrium or steady motion, to develop forces or moments which tend to restore the body to its original condition.

Inherent—Stability of an aircraft due solely to the indisposition and arrangement of its fixed parts, i. e., that property which causes it, when disturbed, to return to its normal attitude of flight without the use of controls or the interposition of any mechanical devices.

Longitudinal—Stability with reference to disturbances in the plane of symmetry, i. e., disturbances involving pitching and variation of the longitudinal and normal velocities.

Stabilizer—A normally fixed airfoil whose function is to lessen the pitching motion. It is usually located at the rear of an aircraft and is approximately parallel to the plane of the longitudinal and lateral axis. Also called "Tail plane."

Stagger—The amount of advance, expressed in inches, of the leading edge of an upper wing of a biplane, triplane, or multiplane over that of a lower wing.

Stall—The condition of an airplane when from any cause it has lost the air speed necessary for support or control.

Streamline Form—A solid body which produces approximately streamline flow.

Strut—A compression member of a truss frame. For instance the vertical members of the wing truss of a biplane (interplane struts) and the short vertical and horizontal members separating the longerons.

Supercharger—A mechanical device for supplying the engine with a greater weight of charge than would

normally be induced at the prevailing atmospheric pressure and temperature.

Surface, Control—A movable airfoil designed to be rotated or otherwise moved by the pilot in order to change the attitude of the airplane or airship.

Sweep Back—The angle of projection of the wings rearward from the point of attachment.

Tail Group (or tail unit)—The stabilizing and control surfaces at the rear end of an aircraft, including stabilizer, fin, rudder, and elevator.

Tail-heavy—In a heavier-than-air craft, the condition in which in normal flight the tail sinks if the longitudinal control is released, i. e., the condition in which the pilot has to exert a push on the control stick to maintain horizontal flight.

Tail Slide—The backward and downward motion, tail first, which certain airplanes may be made to take momentarily after having been brought into a stalling position by a steep climb.

Taxi—To run an airplane over the ground, or a seaplane on the surface of water under its own power.

Trailing Edge—The rearmost edge of an airfoil or propeller blade.

Triplane—An airplane with three main supporting surfaces, placed one above another.

Venturi, Speed-indicating—A Venturi tube may be combined with a Pitot tube or with a tube giving static pressure to form a pressure nozzle which may be used to determine the indicated speed of an aircraft through the air. The pressure difference is measured by a suitable gauge.

Volplane—To swoop down from a height at an angle much greater than the gliding angle.

Warp—To change the form of a wing by twisting it. Warping is sometimes used to maintain the lateral equilibrium of an airplane. Ailerons are not required with a warping wing.

Washin—Permanent warping of the wing which results in an increase in the angle of attack near the tip.

Washout—Permanent warping of a wing which results in a decrease in the angle of attack near the tip.

Wind Tunnel—An elongated chamber, usually a tube divergent at the ends, through which a steady air stream may be drawn or forced. Models of airfoils, of aircraft, or of propellers may be placed in the middle portion of the tunnel, called the experiment chamber or working section, and supported by suitable balances placed outside the air stream, so that the forces, moments, etc., due to the moving air may be measured.

Wing—A general term applied to a whole or a portion of the main supporting surfaces of an airplane, but in the latter case is usually qualified as right wing, left wing, upper wing, or lower wing, etc.

Wing-heavy—The condition of an airplane in which (in normal flight) there is a tendency for the right (or left) wing to drop, if the lateral control is released, i. e., the condition in which the pilot has to exert a lateral force on the control stick to keep the lateral axis horizontal.

Wing Rib—A fore-and-aft member of the wing structure of an airplane, used to give the wing section its form and to transmit the load from the fabric to the spars.

Wing Spar—The principal transverse structural member of the wing assembly of an airplane; a wing beam.

Wing Truss—The framing by which the wing loads of an airplane are transmitted to the fuselage. It comprises struts, wires, cables, tie rods, and spars.

Wire, Landing—A wire designed primarily to resist forces in the opposite direction to the normal direction of the lift and to oppose the lift wire and prevent distortion of the structure by an over-tightening of those members.

Wire, Stagger—A wire connecting the upper and lower surfaces of an airplane and lying in a plane substantially parallel to the plane of symmetry. (Also called "incidence wire.")

Yaw—To swing off the course about the vertical axis owing to gusts or lack of directional stability.

Zoom—To climb for a short time at an angle greater than that which can be maintained in steady flight, the airplane being carried upward by its kinetic energy. This term is sometimes used as a noun, to denote any sudden increase in the upward slope of the flight path.